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THE AMERICAN JOURNAL

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PHARMACEUTICAL EDUCATION

Volume III ***April, 1939*** ***Number 2***

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Academic or Unsuccessful Research*

ARNO B. LUCKHARDT
University of Chicago

I realize that my title is very cryptic, but I think that after the first few paragraphs of the introduction you will understand just exactly what I am driving at. Perhaps the ensuing quotation taken from Gideon Harvey, a contemporary of the great William Harvey, will give you an early insight as to what I am going to say.

There lived in the great William Harvey's time a man whose name was Gideon Harvey and who apparently was very jealous of William Harvey's success after he had published his fundamental discovery on the circulation of the blood. In a book entitled "The Art of Curing Diseases by Expectation," which Gideon Harvey wrote, occurs the following passage:

"The following case of a tailor in Fleet Street, whose name has escaped my memory, though I can with little difficulty recover the knowledge of it, was not ordinary. His complaint to the doctor was of sciatica that rendered him lame and crippled, besides giving frequent returns of very sharp pains. The doctor would not engage in the cure of so great and hazardous a disease without a considerate and distinct answer to three points:

"1. Whether he would sequester himself from his trade for three months;

"2. Whether he valued the expense of fifty pounds beyond the recovery of his health, and

"3. Whether he could contemplate his passion in enduring the part to be laid open to the bone by cutting or burning.

"The patient very readily consented to the two former conditions, time and money, but to the third being entirely adverse, took his leave with the ceremony due to so famed a

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*Presented before the Sixty-seventh Annual Session of the Colorado State Medical Society at Colorado Springs, September 25, 1937. Dr. Luckhardt is Professor of Physiology, Hull Physiological Laboratories, University of Chicago. This paper represents corrected stenographic notes taken during the ex tempore address. The address was illustrated with numerous lantern slides which could not be reproduced because of the expense. Reprinted by permission, from the *Rocky Mountain Medical Journal*, April, 1938. Copyright by the Colorado State Medical Society.

physician and applied himself to another of a much lower form who, with little preamble, advised him to the bath where he received a perfect cure in six weeks.

"No doubt but Dr. Harvey in Anatomy and happiness of theoretic discoveries, might justly pretend the precedency of all his contemporaries and others before and since have also arrived to a great proficiency in cat and dog cutting, also calf-head and sheep's pluck dissecting. Yet few of 'em when concerned in practice, were gifted with sagacity to know diseases when offered to their view, much less capable of curing them, in which curative particular the thinking physician has the advantage though the prating physician, by his pretended anatomy, engrosses the opinion of mankind."

That was the thrust of Gideon Harvey at the great William Harvey, accusing him and others like him of being purely theoretical and not knowing what medicine was about at all.

The thesis I wish to establish under the title of "Academic, Theoretical, or Unsuccessful Research" can be formulated as follows: I wish to show how researches designed primarily and simply and solely to satisfy the scientific curiosity of the individual may redound to the practical advantage of posterity. In doing so, I know I am preaching a moral to you, perhaps, which may not be necessary, but it is good to take stock every once in a while and see that practical discoveries of importance to mankind have really resulted primarily from researches of a most theoretical kind. There are plenty of examples in the past. I will mention but a few.

Harvey was a student at Padua, and his teacher was engaged, at the time he studied there, in an accurate description of the valves of the veins and their functions. The interpretation of the great Fabricius ab Acquapendente was that the valves of the veins of the lower extremities were there primarily to keep too much blood from going down to the extremities. Harvey was not satisfied with the explanation, and, coming back to England, started that varied and ingenious series of experiments which led to the monumental discovery of the circulation of the blood. It was purely a theoretical consideration that led him to investigate this problem with the results that you know.

Borelli and similar Iatrophysicists, at the same time, *calculated*, on the basis of physical assumptions and conceptions, the strength of the heart beat. And, it may surprise you to

know, that they thought that the heart with every stroke pumped blood out into the vessels under a pressure of some twenty-nine thousand pounds. The stomach, on the basis of similar physical considerations, was supposed to exert a pressure on the food, in triturating it, of one hundred and sixty-nine thousand pounds plus.

The Reverend Stephen Hales had a notion to test out with what strength the heart really beat. He found, to his great surprise, in answer to this theoretical question, that instead of beating with the force of twenty-nine thousand pounds it only raised a column of blood up into a glass tube to the extent of eight feet three inches. From that day on the development of blood pressure methods in the laboratory, and eventually in the clinic, was assured and promptly took place. In other words, Stephen Hales tried to answer a theoretical academic question and developed indirectly our knowledge of and methods for measuring the blood pressure, rate of blood flow, capillary resistance, etc.

One of the first teachers and professors of physiology at the University of Chicago was the illustrious Jacques Loeb. In one of his many researches he discovered that a muscle nerve preparation immersed in a salt solution devoid of calcium would go into fibrillation. If he had spoken on the subject to certain bodies of clinicians he would have raised some eyebrows, but no enthusiasm. What if a muscle did fibrillate in the absence of calcium ions? But, after all, those researches of Jacques Loeb were the beginnings of our knowledge of the physiology of the parathyroid glands. Jacques Loeb surmised or guessed that we probably had calcium in our blood to keep us from jumping around like jumping jacks. When McCallum and Voegtlin studied the physiology of the parathyroid glands and tried to determine why animals deprived of them went into fatal convulsions, they looked specifically for changes that might have occurred in the calcium content of the blood. There were hundreds of things in the blood they might have examined besides calcium, but the work of Jacques Loeb suggested that changes in blood calcium should be looked into. From that day on the mystery of parathyroid physiology was assured an eventual solution.

With a certain amount of presumption on my part I will now turn from the past and record a few things that I have attempted to do during a lifetime of academic research—research which was started primarily to answer simple aca-

demic theoretical questions and which yielded results that were capable of practical application.

SECONDARY ADRENALIN REACTIONS

To start with, a friend of mine, Dr. Theodore Koppanyi, and I attempted to determine whether adrenalin would mobilize muscle glycogen. We never finished the problem because we noticed, quite accidentally, that after injecting a subcutaneous area and rubbing it slightly with a finger, there occurred seventeen seconds by the clock after rubbing a sharp rise in the arterial blood pressure. Any number of papers and monographs have been written on adrenalin; any number of pharmacologies will enumerate the pharmacological actions of adrenalin and fail to mention or actually deny that subcutaneously injected adrenalin may cause an hemodynamic effect. That is true, but if you *massage* the area slightly some *fifteen minutes* after you have made the subcutaneous injection, you will get adrenalin rises so high that sometimes the normal blood pressure of the animal is doubled.

The subcutaneous areas injected with adrenalin after fifteen minutes were massaged and there was an abrupt rise in blood pressure to as much as twice normal. We massaged two adrenalinized areas, namely, subcutaneous areas that have adrenalin deposits in them, and noted an enormous rise in blood pressure accompanied by cardiac inhibition—an effect that is particularly undesirable. Of course, these were relatively large injections, for a dog is only one-sixth the size of a man, but nevertheless it shows that adrenalin, subcutaneously injected, can be made to show an hemodynamic effect. Other records demonstrate similar massage of an "adrenalized area" and show an enormous elevation of blood pressure recorded manometrically. When those results were first shown by Koppanyi and me to colleagues, physiologists, and pharmacologists, they said that we must have gotten reflex vasomotor effects. This interpretation seemed preposterous to us because of the magnitude of the response. In a variety of ways we proved that it was due to adrenalin that got into the circulation.

That is all academic research "stuff" to the practicing physician, I am sure. You may say the most it shows is that now, after many years, someone has shown that under ap-

propriate conditions you can get an hemodynamic effect from adrenalin injected subcutaneously. If you look at these results with a slant to the practical, you probably will note the clinical application we promptly had clinicians make of it. If adrenalin, subcutaneously administered, remains unoxidized in the injected site for twenty-four hours one ought to be able to get a hemodynamic effect from it, or if one can get a rise in blood pressure, why not massage the same adrenalized area in cases of asthma? Suppose that a patient has been injected for an asthmatic attack. He again needs relief a few hours later. Why not massage the same area that has been previously injected? You need not make another injection, if there is a deposit of adrenalin in the injected site. On the basis of the results just discussed he ought to get a relief from his asthmatic attack by massage of the previously injected area. I told these results to the late Professor Loevenhart of the University of Wisconsin and he, in turn, told it promptly to clinicians at the hospital. The results were eminently satisfactory, so these clinicians told me. Physicians abroad reported equally gratifying results.

In other words, suppose you are called at three o'clock some morning, after having given an asthmatic an adrenalin injection earlier in the day, and you do not wish to make another house call as is likely at that hour, simply order the patient or member of the family to rub the area that had been previously injected and you can hope for a response in the sense of an alleviation of symptoms.

THE KNEE JERK

Some time ago I was interested in the physiology of the knee or patellar jerk. A friend of mine, who is an expert mechanic, constructed an apparatus, the principal part of which was a solenoid above the knee joint of the dog. This allowed us to tap the patellar tendon by means of a piece of hard rubber attached to the solenoid with any force, and at any time interval that we wished. An animal thus set up for study of the knee jerk can be worked on for eighteen or twenty hours; a patellar reflex can be obtained every seven seconds or oftener for that period of time without showing any fatigue.

Among other things, I was interested to see whether morphine had, primarily, any effect on the excitability of the cord—a purely academic problem. Irrespective of that prob-

lem, a certain number of controls had to be run and I found out that the knee jerk could be reinforced in a very simple way and in a much more certain clinical way on the human being, than any of the reinforcing methods so commonly in practice at the present day.

I won't describe to you the Jendrassik or Laufenauer methods of reinforcement of the knee jerk, for you are familiar with them. Please remember that in both of these methods you are absolutely dependent upon the precise cooperation of the patient. If he does not attempt to pull his fingers apart or squeeze your arm at the appropriate moment, you may obtain, instead of a reinforcement, a diminution of the knee jerk. Furthermore, you are dealing, very often, with non-cooperative people who do not pull their hands apart or squeeze your arm at the appropriate moment.

(a) In the course of this research I found out (and that is the crux of the matter) a method of reinforcement which is foolproof, since it does not depend on an obvious cooperation of the patient and which reinforces the movement of the knee jerks a thousand per cent or more, and does so promptly. The method is, briefly, this:

Any sustained movement by the patient affects the reinforcement. Ordinarily you have the patient attempt to pull his hands apart at a signal or have him squeeze your arm or hand at a signal. In this newly proposed method you need no cooperation on the part of the patient except one, namely, that he must execute a sustained movement. The sustained movement I employed and found eminently satisfactory, even in people in whom nobody had been able to detect a knee jerk, was holding the arm out horizontally from the side, especially if holding out a considerable weight. Give a person a book or a heavy bottle or heavy object of any kind, and the longer he holds it out the more prompt and higher will be the knee jerk during the period of sustained work. Occasional slightly higher jerks are due to respiration; forced inspiration will also exaggerate the knee jerk. The moment a bottle is held out horizontally from the body, the knee jerk is promptly increased at least one thousand per cent. The reinforcement stops immediately after the execution of this sustained movement.

Another method is to ask the patient to extend his leg slightly. If one exercises slight extension of the quadriceps-extensor muscle, there is an enormous increase in the patellar

jerk. Where the patellar jerk is doubtful and where we do not want to depend on the cooperation of the patient to hold out his hand, some heavy object, or his leg, there will be prompt exaggeration of the knee jerk even where many physicians are not able to detect any knee jerk at all.

(b) In working on the knee jerk I was interested to see what effect hyperglycemia had on the knee jerk and so having arranged the animal for registration of the knee jerk, we injected large quantities of glucose. The marked hyperglycemia was studied in its effect on the knee jerk. These animals had been put to sleep by barbital sodium and did not stay asleep long enough for the experiment. That happened invariably, so perhaps, we thought, the injection of sugar had something to do with it.

If one injects sugar (glucose) in an animal anesthetized with barbital, one shortens the period of anesthesia. Inject 20 per cent solution of glucose and the animal begins to awaken. That made us think that perhaps the intravenous injection of glucose would be very useful in human cases of barbital poisoning, produced either accidentally or with suicidal intent.

Before we applied it in the clinic we took a number of dogs and injected them with a heavy dose of sodium barbital. All injections were made intravenously and the rate of recovery from anesthesia was spontaneous. The recovery time, after glucose was given, was fourteen to eighteen hours; without glucose it was thirty-six to forty hours. All experiments save one showed a marked reduction in the period of anesthesia of barbitalized animals as a result of the intravenous injection of glucose solution; and since different animals show different resistance or susceptibility or different depths of anesthesia with barbital, we used the same animals over and over again, allowing a time interval for recovery from the previous injection of barbital.

Other methods have since been introduced in shortening the period of barbital anesthesia, and for persons who have been overdrugged with barbital sodium. The present work simply shows how from a study of the effects of hyperglycemia on the knee jerk we discovered a method which was, as a matter of fact, the first one to combat fatal barbital anesthesia.

These experimental findings were promptly transferred

to the human being. There came to St. Luke's Hospital, Chicago, and to physician friends of mine, a number of cases of severe barbital poisoning. I told them about the method and it worked out in the human being just as it did in the dog. These people recovered promptly and did not die from the barbital intoxication as was common before the introduction of this method.

(c) In connection with certain studies on the knee jerk, we made use of ephedrin. These experimental preparations consisted of animals that had had their spinal cords transsected above the origin of the splanchnics. Their blood pressures were very low, and very poor knee jerk responses were obtained. So I thought of using a little ephedrin to elevate the blood pressure, and to my great surprise found that the blood pressure was not only elevated permanently but that the knee jerk was greatly increased. This gave us a notion that ephedrin, which had not been used successfully in the treatment of shock, might nevertheless be a very useful drug to combat traumatic hemorrhagic or surgical shock. The colleague who helped me in these researches became subsequently an intern in St. Luke's Hospital, Chicago. When the attending physicians at St. Luke's Hospital despaired of the life of a shocked patient this intern asked if he might not try a little ephedrin.

It so happened that two very severe accidents occurred in Chicago about that time. Some men were toppled off a balcony during a fight, and there was a very serious wreck on one of the railroads. Both groups of men in severe shock were brought to St. Luke's Hospital. As I said, when the attending physician was quite sure that the patients would die, having tried all accepted methods of treatment, this intern and former associate of mine, was allowed to inject ephedrin intravenously, in doses of 30 mgms. or more. In one case ephedrin brought the pressure promptly to 110 from a very low level and the moribund patient recovered. An operative case went into shock on the table. Caffein sodium benzoate was given. The systolic pressure was 50. Ephedrin sulphate was given and from that time on the recovery was complete. The action is dual—the ephedrin not only acts in the circulatory system similar to adrenalin, but it also stimulates the central nervous system including the medullary centers. As a result of these dual actions, the patients undoubtedly re-

cover. In another instance, the patient was semi-comatose due to the anoxemia resulting from a very low blood pressure. As soon as ephedrin was given, he recovered promptly.

ETHYLENE ANESTHESIA

One of the most striking examples of academic research that turned out beneficially was the discovery of ethylene anesthesia. It was put up by a friend of mine, a botanist, to determine why carnations died when brought to the greenhouses of Chicago. The losses to the owners of greenhouses and growers were considerable. Dr. Crocker suspected that illuminating gas coming from leaking pipes into the greenhouses might be the cause. When he tested the effects of iluminating gas on carnations, he found that in a dilution of one part of illuminating gas to 40,000 parts of air, carnations promptly withered. They didn't go to sleep; they died.

Illuminating gas consists of a variety of gases, amongst them ethylene. When Dr. Crocker tested out the effects of ethylene alone, he found that one part of the ethylene in 2,000,000 parts of air would effect the same result—withering of the carnations. Ethylene is an unsaturated hydrocarbon, and, apparently, as far as its effect on flowering carnations, sweet peas, and castor oil plants is concerned, is more toxic than carbon monoxide. Since it is an unsaturated hydrocarbon, like carbon monoxide, I thought many people who had died from illuminating gas poisoning probably had died chiefly from ethylene, since it is (or was, at that time) present in illuminating gas. Like carbon monoxide, ethylene could possibly combine with hemoglobin and poison animals. However, I found ethylene was non-toxic to frogs, even in high concentration; but when I pushed the concentration up to 80 per cent or so, *the animals simply went to sleep.* So did dogs when the concentration was put up to 85 or 90 per cent, the rest being oxygen.

This problem was thoroughly worked out on animals. Whether they were frogs, white mice, rats, guinea pigs, rabbits, kittens or dogs, the effects of ethylene in given concentration compared to nitrous oxid given in the same concentration, was found to be superior to the latter as an anesthetic. It was non-toxic, produced anesthesia sooner and more deeply than did nitrous oxid, and had no bad after effects. We used the same animals again and again. One dog was

used sixteen times in the course of three weeks and instead of showing any bad after effects from ethylene, the animal in the laboratory was better off; for it managed to gain six pounds in weight.

We finally obtained some ethylene from a manufacturer and tried it on ourselves. Not knowing the nature nor the per cent of impurities in ethylene, Mr. J. Bailey Carter and I inhaled it and put ourselves to sleep. I have inhaled an ethylene oxygen mixture to the point of anesthesia some 700 or 800 times for demonstration purposes, without any bad after effects. After these laboratory experiments were completed a demonstration was given to physicians and surgeons, and within three days the gas was introduced in the Presbyterian Hospital, Chicago, as an anesthetic and found to be very satisfactory—in fact, more satisfactory than nitrous oxid-oxygen. After accumulating 900 successful operations performed under ethylene-oxygen anesthesia, it was given to the public and profession free without patent rights to anyone. It is used very extensively in this country and abroad.

Here was a problem, based on idle curiosity to determine the degree of toxicity of ethylene on animal life, it being very toxic to plant tissues. Instead of finding another highly toxic gas and adding another to the long list of toxic substances by means of animal experimentation, we now have an anesthetic that proved itself to be better than nitrous oxid-oxygen and one which, in most instances, is more desirable than ether, not to mention chloroform.*

PHYSIOLOGY OF THE PARATHYROIDS

Our studies in parathyroid physiology were also started academically. It was thought that the parathyroidectomized animals died from an intoxication. It was assumed by me that since this hypothetic toxin was adjudged water-soluble and was said to appear in the urine that continually "flushing out the kidney" by intravenous injection of large quantities of physiological saline solutions should keep the theoretical toxins

*Aside from the introduction of a newer and better anesthetic, the discovery stimulated intensive research in the neglected field of anesthesia which had been sterile since 1847 with the result that many new hypnotics, basal anesthetics, and anesthetics have and will be discovered in the future.

in the blood stream at so low a concentration that convulsions would not occur.

The usual parathyroidectomized animals, put on the worst possible diet, died in four to six days. Others similarly operated were injected consistently and intravenously with physiological salt solutions containing calcium and some containing no calcium. These animals, instead of dying in six days, survived.

When I showed these results to Professor Carlson he said it was nursing that kept these animals alive *because thousands and thousands of dogs the world over* have been experimented on to determine the cause of parathyroid tetany and none was ever kept alive. McCallum, and Voegtlin, tried calcium intravenously but the results showed no survival. But these results, using intravenous injections of physiological saline solutions, showed *survival of all animals.* This form of "medication" could be suspended after forty days and the animals put on a tetany-producing diet without going into tetany. Pregnant dogs, ordinarily, die twenty-four hours after parathyroidectomy. By the method alluded to, both mother and offspring survived.

Following this method of experimentation, I devised three other ways of keeping parathyroidectomized animals alive, including the administration of *large amounts* of certain soluble salts of calcium given *by mouth*—an important and commonly used clinical method.

Dr. Dragstedt and Mr. Sudan devised a dietary method of keeping these animals alive. As a result of these combined researches, Dr. Collip probably took heart and made extracts of the parathyroid glands which led to elevation of the blood calcium and survival of the animal. The problem for me was a purely theoretical one, namely, as to whether we were dealing with a hypothetical toxin as the cause of parathyroid tetany. Perhaps both Dr. Dragstedt and I were wrong about the nature of parathyroid tetany; but we, as the first, developed methods in the laboratories of the University of Chicago that *kept parathyroidectomized dogs and, also, parathyroidectomized human beings alive.* The same methods worked out in dogs were applied successfully to human beings, long before Collip prepared his parathormone. Our methods are further more successful than any other including the use of parathormone.

Here, then, was another theoretical and academic problem which, when worked out, yielded results of a life saving character to mankind.

LOCAL ANESTHESIA

Partly for your information, I will tell you some preliminary results that have been obtained in connection with studies of procaine and adrenalin (local anesthesia) which will probably interest all physicians but particularly oral surgeons and dentists.

It is the most curious fact, and one that we physicians should be ashamed of, namely, that after having used enormous amounts of procaine together with adrenalin, the pharmacology of procaine has not as yet been worked out on animals. If you consult Hefter's compendious reference work on pharmacology you will find a few simple paragraphs stating that the pharmacology of procaine has not yet been worked out.

As far as I could ascertain no pharmacologist had studied submucous absorption of drugs and no dentist to date has studied sub-gingival absorption. When some dental practitioners came to me to work on a problem, I thought of a *dental* problem and I had them work on the absorption of drugs from the submucous membrane of the mouth and from the gingivæ using adrenalin and novocaine as test drugs.

The assumption was that that adrenalin was poorly absorbed from the subcutaneous tissues except through massage because of a poor vascularity and because of its vaso-constrictor action. The mucous membrane being more vascular should absorb more promptly. The high vascular areas such as the gingiva should absorb still more quickly.

I will just give you the general results obtained so far. We found that (without rubbing) if we injected the adrenalin in the mucous membrane at the large molars (rubbing, as you know, is necessary if you inject subcutaneously), we got a prompt elevation in blood pressure. If injected in the mandibular region for a mandibular block, a striking rise in blood pressure results even without massage. If injected in the region behind the incisor teeth (in the anterior palatine region) a rise in blood pressure ensues promptly. This rise is as high and is sometimes higher than the original blood pressure of the dog.

I remember one animal having normal blood pressure un-

der paraldehyde anesthesia of 90 mm., whose blood pressure was raised to 180 within about a minute and fifteen seconds after the simple sub-gingival injection of this drug combination. And, if in a given animal, one injects, in succession, these various areas one gets from the submucous, mandibular, and the anterior palatine regions large elevations of blood pressure; the fourth and fifth injection of the maxillary region or interorbital nerve are not possible, because the animal dies of respiratory failure due probably to absorption of novocaine. We, at this late date, will have to work out the pharmacology of procaine.

Dentists, if they don't block the nerve promptly with one injection, keep on injecting procaine with adrenalin until they have the desired nerve block, all the time getting more and more adrenalin plus procaine in the circulation and getting rather rapidly a procaine intoxication. Few dentists ever consider the dose for nerve blocking, or the possible dangers, whether the dosage should be the same for man, woman and child, how often the dose may be repeated, etc. Furthermore, there are certainly few dentists who go to the trouble to see whether a person has any cardiac defect or any hypertension before they inject into the anterior palatine region their customary 2 per cent procaine solution with 1:20,000 adrenalin solution. Some dentists, when they saw these marked and disastrous results in dogs, were reminded of their clinical experience and said, "It is just from maxillary blocks, and particularly from anterior palatine blocks, that the patients go into severe syncope in the dental chair."

This is something for nose and throat men to think about, for they use large quantities of procaine-adrenalin solutions and inject same in a highly vascular area. Undoubtedly many of the sudden deaths from this combination of drugs (which are supposed to be more or less innocuous, in human beings) have been caused by procaine-adrenalin intoxication.

In conclusion, some of the samples of academic research, which eventually led to some useful applications in the clinic, have been given. Although they were started simply to satisfy the idle curiosity of the investigator, and thus in the beginning were simply academic and, from a practical standpoint, unsuccessful, they have proved of ultimate usefulness to our profession.

The Philippine Women and the Pharmaceutical Profession[1]

M. V. DEL ROSARIO
The University of the Philippines

Dean R. A. Lyman of the College of Pharmacy, University of Nebraska, has had the gentleness of requesting me to prepare a write-up for this Journal accounting for the large enrollment of young ladies in our College which to my mind is only one of the effects of "Americanization."

The beginning of this social change can be traced back to 1898 and down the following years when the American Government first took care of our Islands. At that time, higher instruction was practically limited to young men who received a professional education from the only Spanish University then existing; an education, which was basically and essentially psychic and religious.

Our women during those times received their instruction in segregated schools and seldom went beyond the grammar and normal schools, though these had a more extensive curriculum than at present. The only field opened for them was the teaching profession and even this was limited to officially recognized catholic schools.

When the American Government brought American teachers by hundreds to open schools even in the most remote corner of the Archipelago and began to establish the primary grades, coeducation was adopted as one of the most important changes which the people immediately accepted without any reluctance.

The adaptation to the new condition did not take long and we may say that it marked an era in our existence, and revolutionized our ancestral habits.

This radical change had to be instituted also in the secondary schools, and the University of the Philippines had to follow the movement thus marking the route to be followed by the other higher institutions. It was so influential that even the University of Santo Tomas, older than any other in the Union, catholic since her beginning and always progressive, had to request from the Holy See, upon the demand of

[1]Written for this Journal at the request of the Editor.

great numbers of female students, for the permission to institute coeducation on condition that there be separation into two groups during classes and recess. The three private universities established lately were all coeducational. We may also say that besides the existing ones, several high schools and colleges, and two universities have been put up exclusively for women.

All these facts explain this tendency of our women to leave the quietness of "Sweet home" for the hard and hazardous life of a student, and when they have to take up this design for purposes of orientation, in certain cases they follow the most striking directions. We may say that this was the key which opened the minds of our girls to a most advanced feminism. They looked upon these activities not as a privilege but as a right.

Thus in all orders of liberal professions one can find now our women and even in veterinary science, agriculture and engineering there are some rare representatives, not to say anything more of medicine, law, business, chemistry, odontology, etc., wherein the women now constitute a great portion.

In general terms we may say that the preference for pharmacy shown by our young women depends upon the fact that it is a liberal profession which enables them not only to teach, but to practice it freely; and furthermore because the different disciplines which integrate our courses lead them to an easy understanding of the affairs of home management. In the last four years, we count some daughters of our lady-graduates.

In the pharmaceutical profession, the proportion goes to extremes; for in the commencement exercises of this year for instance, there are thirty-nine women candidates and only one man.

This sociological phenomenon in which the graduation is almost monopolized by the fair sex is not exceptional since, for many years back, there has been a scanty number of male pharmacists. The same can be found in the private colleges.

Since the beginning of our College in 1911, this fact has been observed and in 1930, when the four-year curriculum was enforced, contrary to everybody's vaticination, our enrollment has been steadily increasing yearly and at present, there are two hundred sixty-one students of whom only six

are boys, two of them being foreigners. Up to the last year when we celebrated the thirtieth anniversary of our University there were six hundred forty-one pharmacy graduates of whom eighteen were dead and of the living, eighty-seven are males and five hundred fifty-six are females, two hundred nineteen married and three hundred thirty-seven single. Of the latter, the majority is engaged in business or housekeeping, sometimes in both, and not a small minority is teaching in our University as well as in other similar institutions.

The scarcity of men in the profession is felt more and more every day. The different Government Bureaus employ female pharmacists not only as pharmacists of government hospitals but also as assistant chemists, assistant scientists, research assistants, etc., in different scientific branches.

At present three of our graduates are in the University of Michigan, one as a fellow and two as Barbour Scholars working for higher degrees. Quite a few of our women graduates are holders of the graduate degrees such as master of science, doctor of pharmacy and doctor of philosophy.

The accomplishments of our women are really surprising.

The Place of Chemotherapy in a Course in Non-Official Remedies[1]

ABRAHAM TAUB
College of Pharmacy, Columbia University

In the majority of the schools of pharmacy of this country the feeling seems to be that the study of medicinal products should be more or less limited to those of official character. Yet there are a number of substances of non-secret composition which have been shown to be efficacious chemotherapeutic agents; but because they are of a proprietary nature they have been shunned from the course of study. These non-official remedies, as they have been called for want of a better name, are being widely used and prescribed, and many of them have been accepted by the Council on

[1]Read before the Conference of Teachers of Chemistry at the 1938 Minneapolis Meeting.

Pharmacy and Chemistry of the American Medical Association.

A graduate of a pharmacy school who has not become familiar with these medicinal agents is considerably at a disadvantage when he goes out to practice his profession. Foote[2] has ably presented many reasons why a course of study in non-official remedies should be a part of the pharmacy curriculum. This course consists of lectures and assigned bibliographical work. The major part of the course consists of a study of individual remedies. The commercial package is shown, and the student is given a record of the trade name, manufacturer, synonym, condensed formula, properties, uses, form of administration, and miscellaneous remarks. With the exception of some generalizations concerning the broad classes of medicaments, most of this work is of a factual nature.

While a considerable mass of factual knowledge is undoubtedly necessary in most professional courses, there are many educators who feel that much of the above factual information can be obtained by the student during the period of his practical experience. In fact in the state of New Jersey, the gaining of such information is part of the internship requirement and the candidate is examined orally upon his knowledge of these proprietary remedies at the time of his practical examination. On the other hand the state of New York is at present contemplating the inclusion of a theoretical board examination in newer remedies, believing that a study of the proprietary medicines should be a part of the college curriculum.

Excluding such biological proprietaries as vaccines, sera and allergens, the study of which belong within the scope of the materia medica department, the large majority of non-official remedies are chemotherapeutic agents and should be studied within the department of pharmaceutical chemistry. This course is best presented in the senior year, and if we are to do justice to the student's previous training and his background of the several branches of chemistry, we should do more than present a mass of facts. The subject can be made much more interesting and valuable if we correlate, wherever possible, the chemical structure with chemotherapeutic properties. This will give the student a much clearer

[2]Foote, P.A., Am.J.Ph.Ed., II, 195 (1938).

conception of the science of modern medication than if he is studying a number of isolated substances, even though they may have been grouped under class names.

To do this properly we should make no sharp line of demarcation between official and non-official medicaments. It is important to show how chemical modifications of official substances, or of other long known remedies, have been modified to produce substances having new, or different, or more effective therapeutic properties. The reason for utilizing the course of newer remedies or non-official remedies for a discussion of chemotherapeutics is that the science of chemotherapy is still a young one, and the most intensive work is being carried out on more recent medicinal chemicals.

The course should begin with an elementary exposition of the principles of chemotherapy, including such generalizations as chemotherapeutic index, physico-chemical influences, and the effect of specific chemical groups, length of carbon chain, degree of unsaturation and position of substituent group upon chemotherapeutic properties. More specific relationships may be studied to better advantage under individual compounds or classes of products.

The following are but a few of the many places in the course where chemotherapeutic principles may be illustrated:

The arsenicals provide an opportunity for a discussion of the classic work of Ehrlich, as well as of the most recent arsphenamine modifications. Chemical changes in the molecule have lowered toxicity, increased stability, permitted different types of administration and provided medicaments for the different types of syphilis. It is a point of interest that the methanal sulfoxylate group in neoarsphenamine has been found equally effective in reducing the toxicity of another metal, mercury, and is being used as an antidote in bichloride of mercury poisoning.

Among other mercurials, the influence of organic groupings in increasing antiseptic efficiency, reducing toxicity, and obviating corrosive action is illustrated in products such as phenyl mercuric nitrate, Metaphen, Mercurochrome, Merthiolate and others.

Among the phenols, the development of hexylresorcinol illustrates the influence of length of aliphatic side chain upon antiseptic action. The term S.T. 37 permits a discussion of the influence of lowered surface tension upon antiseptic action

due to increased surface concentration of medicament and better penetration into wounded tissue.

The urinary antiseptics provide several interesting studies. The theory underlying the use of mandelic acid involves a discussion of the biochemical processes involved in the formation of the condition of acidosis. An application of pH is involved in the use of nitrazine or methyl red indicators which are used in conjunction with mandelic acid therapy to insure optimum conditions of administration.

Accompanying the study of antiseptics is the comparatively recent development which stresses growth and regeneration of wounded tissue. The proliferating action of the sulfhydryl group is illustrated in such products as Thioglycerol, Thiocresol and cysteine hydrochloride. Other tissue proliferants, such as urea and allantoin illustrate chemical end products in the metabolism of maggots, formerly used in ulcer therapy.

The antiseptic and proliferating action of the dyestuffs, such as the acridine, azo, and triphenylmethane derivatives, as well as the constituent groups of dye molecules, such as sulfanilamide, have been the subject of intensive chemotherapeutic studies.

Modifications of the structure of quinine to produce such products as Euquinine, Chinoplasmin, Atabrin and Optochin have provided better methods of attacking malaria both in the sexual and asexual forms of the gamete.

The large group of barbiturates can be more rationally studied if certain guiding principles are stressed. Substitution by alkyl and aryl groups, length of aliphatic groups and their normal and isomeric configurations all have a direct influence upon such factors as onset of activity, tolerated dosage, duration of hypnotic action, and after effects upon circulatory, respiratory and other bodily activities.

Similarly, the large number of local anesthetics, and especially the p-amino benzoic acid derivatives can be more readily studied if similarities and modifications of structure are pointed out and inter-related with such properties as speed of action, toxicity, absorption through various channels of administration, and other qualities.

The researches involved in the development of such general and basal anesthetics as ethylene, cyclopropane, Vinethine, and Avertin, provide a fine series of chemotherapeutic rela-

tionships. The effect of lipoid solubility upon narcosis involves a study of coefficient of solubility.

The products of salicylic acid, involving substitution of hydrogen of the OH and COOH groups by alkyl, aryl and acyl groups, such as Aspirin, Salysal and Sal Ethyl Carbonate, have varying therapeutic activity and different decomposition rates in the alimentary tract.

The attachment of certain aryl groups to the beta carbon of an aliphatic amine is correlated with action on the sympathetic nervous system in such products as Adrenalin, Ephedrine, Neosynephrine and Benzedrine. Slight modifications of the side chain cause correlating modifications upon blood pressure, nerve and muscle tissue. The product Isedrine affords an opportunity for applying the physical chemistry and calculations involved in the production of isotonic solutions of several ingredients.

The isolation of acetyl choline during nerve activity has led to the utilization of this compound and its derivatives such as Mecholyl in diseases influenced by the parasympathetic nervous system.

The cholane nucleus is a starting point for a number of diverse medicinal products. From it are derived such products as the cardiac glucosides of Scillaren; the sex hormones such as Theelin and its modification, Theelol, in which the chemical structure has been changed to permit oral administration; also the bile acid derivative, Procholon. Another derivative is Calciferol, one of the vitamin D components. The cholane nucleus also permits a discussion of the cancerigenic substances and the possible conversion of certain medicaments into such substances within the body.

These few examples illustrate some of the possibilities of improving the present course in non-official remedies. Such a course is not to be regarded as of purely theoretical significance. It has practical utility. It forms a basis upon which the pharmacist may enter upon an intelligent discussion of drug therapy with the physician.

There may be some who believe that the pharmacist should not enter into such therapeutic discussions. Yet the majority of detail men and manufacturers representatives are pharmacists. They have been trained to discuss intelligently the properties and uses of certain products. The physician very frequently calls upon them for aid and receives in most

cases reliable and practical advice in therapeutic medication.

The retail pharmacist who has received a course such as discussed in this paper, and who has learned through bibliographical practice to keep up-to-date in his knowledge of the newer medication has as a matter of fact an advantage over the detail man. He has no reason to be biased in favor of some particular product. His cooperation will be eagerly sought once he has shown the physician that he is qualified to discuss intelligently and without exaggeration or partiality these newer therapeutic products.

A course such as this is not intended to cover every proprietary product sold. Trade-marked drug mixtures, even if of known composition, have no place in this course. Prefabricated composite medication should in general be frowned upon by the ethical and scientific physician. Every patient represents an individual problem for treatment. No manufacturer can divine the individual situation. Therefore he should not take away from the physician the prerogative of prescribing the specific medicament and dosage that best fits the case.

In selecting the products to be studied, the teacher must be guided by degree of usage and the tested value of the product. A few hundred chemotherapeutic products studied in a manner which involves scientific reasoning will serve the student far better than an attempt to memorize a majority of the products on the market to-day, many of which will not stand the test of time.

While the amount of chemotherapy which can be introduced into an undergraduate course is necessarily limited, yet it should serve to give the retail pharmacist or prospective detail man an impartial and broader view of modern medication, and provide a background for a graduate course in the synthesis of chemotherapeutic agents. The future of therapeutics lies in chemotherapy, and the pharmacist has a definite niche in that field. The sooner he acquaints himself with the field, the better chance he will have of remaining a professional pharmacist rather than a purveyor of packaged medicines.

Although it is manifestly impossible to provide a simple text for such a course, the appended list represents a good selection upon which to base such a course; it is a working basis for student bibliographical effort.

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Business Training for the Pharmacy Student from the Retailer's Point of View[1]

NATHAN ZONIES
Philadelphia, Pennsylvania

A few days ago while discussing the assay of a certain

[1]Read before the Conference of Teachers of Pharmaceutical Economics at the 1938 Minneapolis Meeting.

drug with one of America's leading chemists, I ventured to put a question as to the cost of the particular process suggested by the gentleman. Immediately there was a complete change in the countenance of my friend and he snapped at me with the words, "I am not interested in the cost. We scientists are not supposed to worry about money."

While the position of this gentleman is a most fortunate one we cannot overlook the fact that all work costs money and that somebody must pay the bill. It happens, in the case to which I refer that a large and rich manufacturing firm is subsidizing the professor's work thereby relieving him of all care and worry about finances.

This is a most enviable situation, but in the practice of retail pharmacy there is no subsidy by any one, much less by manufacturers. In fact, instead of subsidy we know of many instances where large and rich manufacturers actually compete with the retail pharmacist for patronage. Particularly is this true where the patronage of the physician is concerned. Many large pharmaceutical manufacturers whose businesses have been built up largely by the help of the retail pharmacist have seen fit to circumvent the retail pharmacist in the distribution of their wares to the medical profession and are supplying their products directly to the physician.

The retailer in the pharmaceutical field, whether we call him a professional man, or a business man, or both, must stand on his own. He knows no subsidy, he receives no subsidy and he cannot extend subsidy to others. Competition is far too keen to allow any unusual profits and the world spins altogether too fast now days in retail pharmacy to permit procrastination. Profits must be made today to pay today's expenses because tomorrow presents its own bill of costs and overhead.

Time is past when the retail pharmacist was in a position to complete the student's education by supplementing the college instruction with business training on alternate days during the college year. The college today demands almost the full day time attention of the student. And the courses being more strenuous than formerly the students' physical and mental faculties must be kept in trim with sufficient rest and recreation.

We now come to the question of whether a business training for the pharmacy student is necessary, and, if so, who is to

assume the responsibility of handling this business training. As a retail pharmacist my opinion is that a business training is definitely necessary for the pharmacy student. As to the responsibility for this business training, it should be shared by all three parties concerned. By the three parties we mean, the individual student, the college and the retail pharmacist employer.

In the practice of pharmacy we have both a professional and business enterprise. A profession is a calling or vocation that demands a good education. A business or commercial venture is an enterprise in which one engages in order to make a living. Regardless of any feeling of altruism on the part of those who teach, the economic factors cannot be overlooked. To do better work in any calling better living standards must be provided. Better living standards can only be provided if economic security is assured to a reasonable degree. To assure this security a business training is necessary for those who intend to practice pharmacy.

The best work in any calling is done by healthy minds. Only economic security can assure a healthy mind. The best medical practitioners are those whose economic security is assured. They have obtained this security by applying good business training to their particular calling. The same holds for those who practice law, engineering, architecture and, today, even for the clergy. We know now that the most successful churches are in the hands of men who are good business executives in addition to being able men of the cloth.

To improve the profession of pharmacy the economics of pharmacy must first be improved. One cannot make progress without the other. It behooves those who teach pharmacy in our educational institutions to give attention to the subject of business training of their students so that these students may be able to master the complex economic problems that confront one in any line of endeavor.

This can best be done by a cooperative plan between the colleges and established retail pharmacists whereby the business instruction is given by men of practical experience in the retail field. If colleges of pharmacy were to choose, from a selected number of retail pharmacists, guest lecturers on business conduct as applied to the practice of pharmacy, it is my belief that considerable good could be accomplished.

Time is long past when the college professor trembled at

the mention of the word money. We know now that the very institution or building in which the teaching takes place would not be there if money had not been provided by some one in some way.

While the true spirit of a professional career is symbolized in the words "to serve", we must realize that "to serve" we must be able to live well, and that cannot be done without a sound economic state.

Yes, complete cooperation on the part of college, professors, students and retail pharmacists is necessary to do for pharmacy what pharmacy expects of us.

Teaching the Commercial Aspects of Endocrines[1]

WILLIAM H. STONER

Melical Research Division, Schering Corporation, Bloomfield, New Jersey

In spite of occasional statements that certain individuals are in the several professions for altruistic reasons, in the last analysis our interests in whatever work we happen to pursue are primarily financial, whether it be pharmacy, medicine, dentistry, politics, pedagogy, law, or theology. Maintenance of life and provision for old age are universal basic objectives. The economic side of the practice of medicine is rapidly monopolizing the programs of medical societies, and pharmacy schools are going more thoroughly into commercial considerations. This is as it should be, for the commercial aspects of pharmacy are inseparable from the scientific, and an adequate knowledge of both is essential to the successful practice of the profession. Accordingly economics is now properly a major course in the pharmacy curriculum.

The teacher of endocrinologic aspects of pharmacal economics must master and transmit to the student the essential facts of the physiology, pharmacology, and therapeutics of the endocrine glands, as without such knowledge acquaintance with packages, prices, etc., is meaningless. Possession of such knowledge distinguishes the scientific from the clerk-salesman type of pharmacist. Just as in a consideration of the

[1]Read before the Conference of Teachers of Pharmaceutical Economics at the 1938 Minneapolis Meeting.

financial aspects of other remedies, those of endocrine products may well be presented to the student from the standpoints of the purveyor of raw material, of the manufacturer, of the wholesaler, of the retailer, of the physician, and of the patient.

Sources of raw material increase in number and variety as more endocrine products are developed. Formerly the large meat packing establishments supplied the manufacturer with all the crudes for endocrine preparations. With increased demand prices of crude glands have sky-rocketed so that today some of the smaller glands, and those giving lower hormone yields, have become unobtainable except by the larger manufacturer and on long time and large quantity contract. Even the housewife knows of the rise in prices of liver and sweetbreads. Search for extra-glandular sources has led to amniotic fluid, placenta, urine, blood, and vegetable substances. The commercial views of the meat packer are being revised as the organic chemist isolates, identifies and synthesizes one hormone after another. The starting points of these syntheses vary widely, including such substances as pregnancy urine, woman's and mare's, the soy bean, benzaldehyde, and many other organic compounds. Several of the meat packers, not content with selling to the endocrine manufacturer, have entered into active competition by marketing finished glandular products themselves.

Since more pharmacy graduates than formerly are absorbed into the manufacturing field it is appropriate that the pharmacy curriculum include the necessary training. Many schools have added to their faculties men with experience in the commercial aspects of pharmaceutical manufacture, who present, not merely theoretically, but first hand, the commercial aspects as they particularly concern the manufacturer, and who can give interested students valuable counsel concerning choice of firm, salary expectation, etc. Certain pharmacy schools send teachers to the larger manufacturer for considerable periods as volunteer, unsalaried workers to gain such information.

The manufacturer's commercial concern is to create as large a differential as possible between cost and sale prices. In an attempt to minimize costs of crude materials sources of supply the world over are combed carefully. In addition to the domestic supply, glands come to this country from

South America, Australia, Scotland, and South Africa. Some of the larger marine animals are being investigated as possible commercial sources of glands. Similarly in the case of synthetic products cost is considered carefully in the selection of the starting substances.

In the calculation of the manufacturer there must also appear cost figures for patents, production, research, assay, packaging, advertising, distribution, overhead, salaries, rental, taxes, legal services, etc. The general text-books on cost accounting with appropriate modifications are adequate in presenting to the pharmacy student this material as it relates to general pharmaceutical products, but in the case of endocrine products no fixed perennial outlines of instruction can be followed, as the changes are so rapid that much time is required in collecting all available necessary information and keeping it up to date. Text-book summaries are obsolete before publication, and articles in the scientific and medical journals are often immediately superseded by others.

The sale price of a product is determined by many complicated factors among which are cost of production, competitive prices, laws regulating interstate commerce and fair trade, internal revenue, and other official regimentation. Proper presentation of these considerations necessitates a legal knowledge of all pertinent acts, laws, decisions, and rulings.

Development of new outlets for products is largely the accepted responsibility of the manufacturer, although the accrued profits benefit also the wholesaler and the retail pharmacist. Among the more recently developed fields for endocrine therapy are the dermatologic applications of the sex hormones, the gynecologic applications of male hormones, psychiatric hormonal therapy, and the applications of hormone therapy to veterinary practice. Every such new field unearthed by the pharmaceutical prospector and developed by systematic research brings the endocrine percentage of the $300,000,000 United States annual bill for drugs and medicines to a higher figure.

Another matter chiefly the concern of the manufacturer is patents. Much has been said and published on this subject and extreme views have been expressed. Some maintain that no remedial substances should be protected by patents, others that all should be. Some hold that the physician

cannot ethically patent his discovery, and that it is not a function of educational institutions to administer patents through licenses to manufacturers. Yet the fact remains that those substances protected by patents not only yield greater profits to the manufacturer, wholesaler and retailer, but also serve the consumer better than the unprotected, highly competitive, grocery type of product. Compare for example, the dependable pharmaceutical income and the therapeutic satisfaction from insulin under the administration of the Insulin Committee with the chaotic price situation and clinical disaster with unpatentable sulfanilamide. Naturally manufacturers sometimes attempt to extend the basic claims of their patents too broadly in order to exclude the possibility of competition in all related fields. In spite of all the abuses of patent rights the student should be made to understand that at least for all connected with the pharmacy profession patents are beneficial.

Still another commercially important function of the manufacturer is research, pure and appplied. Physiologists, pharmacologists, and biochemists in the laboratory of the endocrine product manufacturer search constantly for new hormones and for more effective modifications of existing ones. Continuous attempts are made to develop effective oral forms of hormones now effective only by injection. The commercial value of an entirely satisfactory oral insulin substitute cannot be over-estimated. Enormous sums have been expended on this problem.

The teacher of the economic aspects of endocrine products should emphasize the costs of these less obvious expensive functions of the manufacturers so as to dispel the idea, frequently expressed by the physician and his patient, that prices of endocrine products are unwarranted.

The wholesaler's interest in endocrine products is even more nearly entirely commercial than that of the manufacturer, or than that of the retail pharmacist who comes into contact with the prescribing physician and the patient. The wholesaler, however, must have a comprehensive general knowledge of the progress of endocrinology, especially in regard to new products and new dosage forms. His primary interests are the spread between cost to him and price to the retailer, and sales volume. Like the retail pharmacist, the wholesaler resists stocking a new item until there is

created a demand sufficient to move the product. Thought must be given to maintenance of stocks, especially of the emergency products, and to facts concerning preservation and deterioration. Methods of inventory and orders are of great importance to the pharmacist, wholesale and retail.

To the retail pharmacist probably the most important commercial aspect of endocrine products is the old question of the multiplicity of packages that must be stocked. Various extractives and their synthetic counterparts from a dozen glands are distributed by a hundred different manufacturers in numerous dosage forms, and numerous sized packages for administration by every known medication route, oral, rectal, parenteral, hypodermic, intramuscular, intravenous, vaginal, percutaneous, and even intranasal. The enormous number of packages available compels the retail pharmacist to stock only those for which demand has been created in his neighborhood.

The subject of loss by spoilage from deterioration and loss of potency must be presented to the student. In general whole glandular substances and extracts deteriorate more rapidly than the purer extracts and their synthetic counterparts, but less rapidly than vaccines, antitoxins, etc. The fact that female sex hormone has been found in coal of ancient geological formation is probably significant in connection with the stability of estrogens and chemically related substances.

Although, since endocrines are practically 100 per cent. prescribed, the role of the pharmacist is passive in the selection of type, brand, and dosage form of product. He should have full knowledge of the relative potencies of the various types and brands of hormonal preparations. Such information is best presented to his student with the actual packages before the class. Manufacturers are anxious to supply material for this purpose.

In spite of there remaining a considerable residual sale of totally inactive "glandular debris" (Hoskins) it is to the commercial interest of the pharmacist to do his part in bringing the physician to a knowledge of the newer, potent, assayed products, both the highly active synthetics and the less active extractives. From the commercial standpoint alone it is desirable that the traffic in the older, cheaper, ineffectual glandular products be converted as rapidly as possible into sales of the newer hormonal preparations of higher activity and price. The manufacturer of polyglandu-

lar mixtures has taken comfort in the possible applicability of the Weber-Fechner psychophysical law to endocrine therapy, stating that the organism will utilize from a mixture of hormones only those in which it is deficient, while those not needed do no harm, since they do not augment appreciably the actions of the hormones secreted in normal quantities. Obviously this sophistry cannot apply to totally inactive preparations. It is probably more excusable for the retail pharmacist than it is for the manufacturer to continue to meet the rapidly diminishing demand of the older physician for the inactive, placebo type of glandular and polyglandular substance. The pharmacy student should be taught that of all desiccated glandular substance products only thyroid is active by mouth, that desiccated ovarian preparations were ommitted from New and Nonofficial Remedies by the Council on Pharmacy and Chemistry eight years ago, that activities of oral desiccated poly-glandulars are equal to that of their contained thyroid, that United States Pharmacopœial thyroid in active dosage is an economical drug compared with trade-named poly-glandulars containing it in infinitesimal dosages.

Endocrine therapy differs from treatment with other classes of remedies in that it is largely replacement therapy compensating for deficiency or absence of the hormone concerned. There is little if any restoration of hormone production by the gland after degenerative changes have occurred. Treatment, therefore, with insulin, thyroid, liver, and other hormones is frequently long continued, and in some cases maintenance doses must be given at various intervals throughout the life of the patient. The endocrine patient is, therefore, a steady repeat customer. For example, a diabetic taking 15 units of insulin at each meal since the introduction of insulin in 1922 will have left over $1000 in the pharmacy at his corner.

In presenting the subject of endocrinology to the pharmacy student each of the dozen glands of internal secretion should be considered seriatim. Essential facts of anatomy, histology, physiology, pathology, pharmacology, and clinical application should precede a presentation of the commercial aspects by a demonstration of brand packages for each gland. Careful distinction should be made among powdered gland, extract, and pure hormonal substances, natural and synthetic, with emphasis on the bearing of these distinctions on potency and cost per unit of activity. This involves the

confusing and ever changing subject of assays and units in which the United States Pharmacopœial Revision Committee is now interested. The student should be made familiar with the many methods of assay and the many units—rat, mouse, rabbit, international, United States Pharmacopœia, Allen-Doisy, Clauberg, etc. He should be taught the lack of necessity for units or assay of hormones in chemically pure state and the desirability of expressing potency of such products unequivocally in absolute terms of weight, just as in the case of the vitamins, before pure chemical compounds were identified as the active substances potencies were expressed in various units, and after identification in terms of weight.

The scientific facts concerning endocrine glands are best presented to the students visually by means of projection upon the screen of well chosen illustrations, tables, charts, etc., either specially prepared or taken from standard sources, as Carlson's The Machinery of the Body, or Hoskins' The Tides of Life. Other convenient sources of scientific and commercial information of value to the teacher of endocrinologic economics are the United States Pharmacopœia, New and Nonofficial Remedies, and scientific and clinical journals (as Chemical Abstracts, Endocrinology, and the Journal of the American Medical Association), the new products columns in medical and pharmaceutical journals, United States, British, and German Patent Reports, Gutman's Modern Drug Encyclopedia and Therapeutic Guide, the Red Book Price List Section of Druggists Circular, the Blue Price List Section of American Druggist, and the manufacturers' lists and other printed matter. Selected collateral text-book and journal reading should be prescribed and reports required. Lasting impressions concerning endocrine disorders may be left with the student if it can be arranged to visit a general hospital under guidance of the endocrinologist, or to bring representative groups of patients before the class at the time each gland is discussed.

Today when there is so much talk of state medicine the teacher of pharmaceutic economics may well give thought to its effect on the drug trade. Many tax supported hospitals even now issue drugs, including hormone preparations, free and promiscuously to the patient.

A consideration of the commercial side of endocrinology would be incomplete without a reference to the physician's viewpoint. Just as with the invention of the electrocardio-

graph physicians first began announcing themselves as cardiologists, and as with the advent of insulin physicians began specializing in its use, so recently, with the appearance of the several really active and dependable hormonal preparations from other glands of internal secretion and their synthetic counterparts, physicians here and there are pleased to refer to themselves as endocrinologists. Certain gynecologists have come to specialize in the use of the female hormones, certain urologists in the use of the male hormone, certain neurologists in the use of the anterior pituitary substances, and certain internists and pathologists with cyclopedic tendencies have developed into general endocrinologists, attempting to cover the entire field of hormonal disturbance, and frequently assembling short lived text-books on the subject. Financially such specialization is frequently a success and the pharmacist with a real active endocrinologist in his increasingly hormone-conscious neighborhood is fortunate. Every physician regardless of specialization is interested in one phase or another of endocrinology. As in other fields the busy physician looks to the pharmacist for information concerning devlopment of new endocrine products, and favors the pharmacist giving best service.

So far as the patient is concerned the only commercial consideration is to obtain the specified product at lowest cost. The physician considers the patient's interest when he takes the trouble to determine brand and dosage form in which the patient obtains maximum activity and length of therapy for minimum expenditure, and the pharmacist serves his customer best who gives the physician the pertinent comparative data. From the patient's standpoint what might be referred to as the "commercial index" of a product—treatment days over cost—is often no less important than the therapeutic index.

There is plenty of opportunity for pedagogic originality in teaching pharmacy students the commercial aspects of endocrines. By a combination of projection slides, charts, tables of comparison, pictures of typical cases of endocrinopathies, presentation of the patients themselves, and demonstrations of assays and of packages, the pertinent facts can be presented visually in an interesting way. The purpose here has been to suggest methods of teaching the essential facts pertinent to a commercial consideration of the endocrines by presenting a selection from the many facts of a few of the

more obvious topics which when pursued further by the teacher will lead naturally to others of equal or even greater importance.

Simple Experiments to Impress Students[1]

CHARLES W. BAUER
Massachusetts College of Pharmacy

Perhaps you are lucky enough to have all the time you think you need for your lectures, demonstration experiments, recitations, and laboratory work. If so, you can consider yourself exceptionally well blessed for practically every professor of every subject is complaining about the same thing—lack of time. If each professor were given as much time as he thinks he should have to teach his subject, we could soon do away with one of our greatest evils, commencement speeches, because the poor student would die of old age before he could qualify as a candidate for a degree.

Frequently, we think we can overcome this lack of time by crowding more and more subject matter into our lectures, by giving assignment after assignment of supplementary reading, or by adding experiment to experiment in the laboratory work. These methods accomplish little and lose much, as many here can testify.

As far as I know, there is no satisfactory substitute for time; however, much can be gained by well-planned, properly supervised experiments which the student can and will perform. Entirely too much of the laboratory work is done in the library, and too much of the supervision is left to assistants. I believe in libraries, assistants, and graduate students. They are a great help but I also believe that the best place to learn chemistry is in the laboratory, and that the professor in charge of a course belongs there as well as in the class room. Too many experiments have been planned in a swivel chair or copied from other manuals. That is why so many experiments require a great deal of the students' time and have little, if any, teaching value.

It is agreed that many experiments are necessarily long

[1]Read before the Conference of Teachers of Chemistry at the 1938 Minneapolis Meeting.

and worth every minute of time it takes to perform them, and that others are somewhat complicated because they cannot be otherwise, but a great many can and should be drastically modified, especially for the first year student. I have no sympathy with and shall not dwell upon those experiments which use large quantities of reagents, which produce liters and liters of foul smelling poisonous gases, smoke screens to protect a navy, or explosions that rock buildings. The remedy for such conditions is self-explanatory. Rather, let us discuss those experiments which have teaching value, but which may have even greater value through simplification. Any one of us can readily suggest a number of good examples. Let us consider an experiment familiar to all of us—the reaction of nitric acid on zinc. We teach that the reaction products depend upon the conditions of the reagents. We teach that nitric acid is the oxidizing agent and that under proper conditions, its nitrogen may be reduced to its lowest valence and give ammonia. This is all very true, and yet, when the student performs the experiment, he finds the ammonia in the form of ammonium nitrate. It becomes necessary to use a fixed alkali to liberate the ammonia which places more emphasis upon the test for an ammonium compound than it does upon the fundamental principle involved.

With a slight modification in the directions the ammonia is produced directly from nitric acid and zinc, and this seems to make a much deeper impression on the student. We have tried both methods, and have found that with the classical method the student recalls the experiment with difficulty, if at all, while in the simplified form practically the entire class can recall the experiment, and what is even more important, discuss the fundamental principle which is involved.

It may be wise to perform this experiment in case some of you are not familiar with it. For this demonstration, we shall use rather large quantities so that the reaction may be observed from all parts of the room.

If we moisten about 50 grams of powdered zinc with about 20 cc of dilute nitric acid 1:10 and wait a few minutes, the reaction will manifest itself. Notice, that enough ammonia is produced to convince the most skeptical. Now if we moisten some litmus paper with dilute nitric acid and expose it to the gas, we get a confirmatory test for ammonia which is also very convincing. After performing this experiment

the student seems to realize also that an ordinary chemical equation, such as this one—

$$4Zn + 9\ HNO_3 \longrightarrow 4\ Zn\ (NO_3)_2 + NH_3 + 3H_2O$$

fails to tell the whole story, and that the conditions of the reagents are important. When the student begins to make note of the conditions under which a chemical change takes place, he is beginning to learn chemistry.

In my opinion, the well planned simple experiments which the students can and will perform, not only save much precious time, but have the greatest teaching value.

Qualifications for the Teacher of Pharmaceutical Chemistry[1]

LAWRENCE H. BALDINGER
University of Notre Dame

The speaker hardly feels competent, chiefly because of teaching immaturity, to do more than merely comment upon and to express personal opinions upon the qualifications for teachers of pharmaceutical chemistry. It is hoped that these comments or opinions will express the attitude of a great number of younger teachers and graduate students who, after completing their work in pharmacy, have continued their studies toward advanced degrees in one or the other sciences which collectively constitute the profession of pharmacy, and who feel that even though they may stray from the parent profession to enter other fields, in so doing they may elevate the standing of pharmacy in the eyes of others.

The term "pharmaceutical chemist" has been used rather loosely throughout the past quarter-century. The practice of conferring the so-called Ph. C. degree upon the completion of three or four years work in pharmacy, depending upon the rules and regulations of the institution, has for the most part been discontinued. Usually the man receiving the certificate of pharmaceutical chemist in order to apply for registration as a registered pharmacist was anything but a chemist; once he had become legally licensed as a pharmacist, however, the Ph. C. behind his name and on his

[1]Read before the Conference of Teachers of Chemistry at the 1938 Minneapolis Meeting.

show windows has with each year become more valuable from an advertising standpoint as the public becomes more and more "chemistry conscious". (Ivor Griffith: Am. Jour. Pharm. 110, 184 (1938). It must be admitted that we have physiological chemists, biochemists, sugar chemists, paint chemists, clinical chemists, analytical chemists, etc., but it must also be admitted, even at the risk of being supercritical, that the term pharmaceutical chemist does not carry as much prestige in the field of chemistry and in other professions as do some of the other terms mentioned.

One naturally wonders why such a condition was permitted to start and when it will be changed. One of the factors which helped to bring about the condition was the practice on the part of smaller schools or those with no university affiliations, of having a druggist teach so-called pharmaceutical chemistry on a part-time basis. Inasmuch as a spring can rise no higher than its source, the students received only as much chemistry as was within the command of the druggist teacher, who, because of business interests, could not or would not take advanced work in chemistry in order to keep abreast of new developments in the science. This condition has long since been corrected but do we not have a similar controversial condition in some schools where, because of restricted budget, departmental controversies, absence of university affiliations, or for one of the many other reasons, all of the required chemistry courses are taught within the department or school of pharmacy, all grouped under the general term "pharmaceutical chemistry", taught quite often by men whose chemistry training has not gone beyond the bare fundamentals. This method of presenting chemistry to pharmacy students, especially when the druggist teacher presented the courses, worked hardships in many cases. Many medical schools denied pharmacy students full or part credit for their chemistry courses. The medical schools have been slow to change their rules, hence many students are still having difficulties when pharmaceutical chemistry credits are offered for entrance to medical schools. And what must pharmacy students on an inspection tour of pharmaceutical manufacturing plants think when they meet recently-hired young men, chemists from this school, chemical engineers from that school, with no pharmacy background whatsoever? Soon the average pharmacy student is going to ask why his training does not give him an equal chance to compete for these posi-

tions. What are the pharmaceutical educators going to tell him?

In discussing the qualifications for teachers of pharmaceutical chemistry or, more correctly, it is believed, of chemistry as applied to pharmacy, only two types of schools will be mentioned: the one in which the fundamental chemistry courses, inorganic, qualitative, organic, and quantitative, are given by the chemistry department, after which the student takes up drug and food analysis, quantitative pharmaceutical chemistry, synthetic medicinal chemistry, etc., in the department of pharmacy; the other type of school in which all of the chemistry offered to the student is taught within the department of pharmacy.

While the first type of school does put the pharmacy student on a par with others as far as chemistry course work is concerned, too often the instructors are not only uninterested, but also unfriendly toward pharmacy and its aims, and often openly criticize the profession. If the instructors in the department of pharmacy can offset these ill effects until the student comes under their direction, he will usually have a strong sense of conviction and very definite aims concerning his chosen profession.

In the second type of school the instructor has a splendid opportunity to stress the importance of chemistry to pharmacy, but one of the chief disadvantages in this type of chemical training lies in the fact that fundamentals of the science are often slighted in order to show the application of chemical facts to practical pharmacy. For instance, it is much easier and a greater temptation exists in qualitative analysis to point out the effect of sodium chloride as an antidote for silver nitrate poisoning than to stress the principle of solubility product, the common-ion effect, or the application of this reaction in the Volhard titration. For some state board examinations the former information might suffice, but it could hardly be considered in keeping with good chemical pedagogy.

Obviously the teacher of pharmaceutical chemistry must have had an undergraduate training in pharmacy. As a consequence he should be friendly to and in accord with the aims of pharmaceutical education. In order to qualify as a teacher of chemistry he should have a well-balanced graduate training in organic, physical and analytical chemistry, one as a major, another as a minor. It is understood that he is to be a member of the American Pharmaceutical Association.

If he is financially unable to be a senior member of the American Chemical Society, he should at least affiliate himself with the local section of the society and take an active part in its activities in order to create a friendliness toward pharmacy and pharmaceutical chemistry. If finances permit, he should subscribe to and peruse systematically specific chemical journals, i. e., *Journal of Chemical Education, Journal of Organic Chemistry,* etc., in addition to the three journals published by the American Chemical Society.

In a communication early this spring Professor Bergy of West Virginia University commented upon the qualifications for teachers of pharmaceutical chemistry. He states, "It is one of the most embracive of all chemical courses . . . it requires a training in everything from A to Z." He concludes by asking, "What book ever published requires a broader knowledge of chemistry for its comprehensive understanding than the United States Pharmacopœia?"

In closing, the speaker would like to repeat and add to the queries expressed earlier in this paper. When are our pharmacy students to be given full credit in medical schools for pharmaceutical chemistry? When are the pharmaceutical houses going to hire four-year pharmacy graduates for plant and control work? When are our four-year pharmacy graduates going to be able to enter graduate work directly without spending from one-half to a full year working off pre-requisites which they should have received as undergraduates?

The Teaching of Pharmacognosy[1]

LEASURE K. DARBAKER
School of Pharmacy, University of Pittsburgh

The first part of this paper includes some of the material presented at the Madison, Wisconsin, meeting of the Plant Science Seminar by my colleague, Edward P. Claus. At the School of Pharmacy of the University of Pittsburgh, botany is given in the first year and pharmacognosy in the third. Although there is an interval of a year between these subjects, they are taught by the same instructor and we think this has

[1]Read before the Conference of Teachers of Pharmacognosy and Pharmacology at the 1938 Minneapolis meeting.

an advantage. The laboratory work in botany is made practical and interesting so the student remembers it, and he begins the study of pharmacognosy with the interest of an explorer entering a new field in which there are many things to be discovered.

The instructors in these departments deem it best to begin the botany laboratory with a study of the plants which the student sees daily, such as the spermatophytes. This procedure is directly opposite to the customary taxonomic method which begins with the lowest forms of plant life. Experience has shown that if the students are given, in their early laboratory days, something they can identify, their interest is immediately stimulated.

The laboratory work is begun with a study of the field aster, the morning glory, the corn and bean seedlings, and later the more complex spermatophyte forms. Certain type forms of the pteridophytes, the bryophytes, and the thallophytes are taken up. All laboratory work is interspersed with simple experiments on living plants. Microscopical work is done throughout the year but not as a separate course.

Early in the course the students are taken on a collecting trip as a laboratory exercise. As there is much overlapping of the southern and northern flora in the Pittsburgh region, an abundant source of plant material is readily available. The first trip is through Frick Park and at the end of the period, the students assemble in a log cabin to study the plants collected and to rearrange them in the plant presses. During the year the students collect, press, and mount at least 50 official drug plants. Thus the students are encouraged to make an herbarium of their own. Later, many use these mounted plants for window displays.

An average of four collecting trips are made each year. The students not only collect, but they study the plants in the field. The last trip is made in the spring. One trip is made to the Carnegie Museum. Motion pictures are taken on every trip. These form a permanent record and in later years are valuable for class reunions.

The course in pharmacognosy extends over two semesters with one lecture and a three-hour laboratory each week.

The lecture work is designed to teach the gross structure and physical characteristics of plant drugs, methods of collection, preservation, identification of impurities and adulterants. Each student is given a generous specimen of the

most important plant drugs. These are mounted on cards (3 by 5 inches) and attached to another card containing the most important information regarding that specific drug.

The laboratory work consists in a brief review of the cells, cell contents and the structure of the various plant parts. A field trip is scheduled for the purpose of acquainting the students with the plants yielding the most important indiginous barks used in medicine. The barks are collected by the students and during the next laboratory period are studied for gross and structural features. This is followed by a study of the most important official and non-official woods, roots, rhizomes, leaves, fruits, seeds, and non-cellular drugs. Identification tests, both microchemical and microscopical, are made for purity of powdered drugs, talcum powders, infant foods, spices, and condiments. Tests for these materials form an important part of the course.

Instruction in bioassay is given during the second semester with the student performing at least one assay for the drugs in the heart tonic group.

The course ends by one period being devoted to the study of a fresh drug plant, and one period to the study of an unknown drug.

The laboratory and field work is supplemented by lectures, displays, lantern slides, motion pictures and demonstrations. Material from the drug garden is used extensively.

Teacher, Study Your Market![1]

RALPH W. CLARK
Merck & Company Inc., Rahway, New Jersey

Most of the graduates from colleges of pharmacy enter the drug store as clerks, soon to become registered pharmacists. Having attained additional experience and some capital, they become proprietors in due time. Others become hospital pharmacists or employees of manufacturing concerns. This paper is intended to provoke discussion of certain educational policies which will be helpful to teachers giving instruction to students who intend to follow any of these three types of pharmaceutical work.

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[1]Read before the Conference of Teachers of Pharmaceutical Economics at the 1938 Minneapolis meeting.

During the past months I have had an opportunity to discuss the subject of market with a number of educators, and I find that many of them are giving it serious thought. They are especially interested in the hospital pharmacy. Perhaps the reason for this is that some people look upon the hospital pharmacist as representing the highest type of professional service. Although the number of available positions in hospital pharmacies are relatively few, the hospital pharmacist does make a real contribution to the social and economic life of the community. Some colleges are developing or modifying their curricula to more adequately train the student for hospital service. When a student goes into hospital work, he does not have the opportunity of acquiring knowledge about buying and selling that a student who goes into a drug store does. Therefore, some special training along this line would seem desirable.

The manufacturer employs the college graduate in a number of capacities. He may be a routine laboratory worker, a research worker, or have an administrative or sales position. The field he enters is determined by his desires, his capabilities, and the needs of the employer. Whatever the training given, whether in English, economics, commerce, or science, the aim should be to increase the student's ability to create new ideas and new things. His reading habits should be developed so that he will follow all literature relative to his work.

The majority of the graduates from colleges of pharmacy become employees in drug stores. It behooves teachers to study this market and to inquire earnestly into what the pharmacist in charge is going to expect of this young man or woman when they enter his store.

Many teachers in pharmacy schools are not making enough effort at revising curricula and improving teaching methods, to meet the criticisms of the retail druggist. Perhaps a visiting committee from the state pharmaceutical association would help teachers to study the market for their students. Most teachers would be glad to profit by and follow such a committee's suggestions as far as is possible. Students are eager to know what is expected of them when they go to work in a drug store. Perhaps the high degree of specialization now common among teachers has made it impossible for them to comprehend the problem as a whole; to let them see the necessity of studying the market for their students; and

to enable them to give their graduates the broader education needed as a superstructure built on a foundation of fundamentals.

There are many complex problems in retail employment and the securing of competent help is becoming more difficult. The employees in a retail store must be sales people and not non-selling employees. Teachers need to study what is expected of clerks, what employers get from them as well as what they do not get from them.

Several pharmacists took part in a discussion following a brief presentation of "What is expected of an employee in the drug store" before the Wisconsin Pharmaceutical Association two years ago. It was encouraging to hear these men bring out that clerks should be treated as professional men; that rules should not be so hard as to spoil natural ability; that working hours should be shortened; and that clerks should know something of and have reason to have confidence in their employer as well as their own future.

I wish to add the following abstract from the *Maryland Pharmacist* concerning the employee problem: "Managements have failed to take their employees into their confidence, failed to present adequate financial information to them, failed to give them a picture of conditions. It is axiomatic that strife invariably springs from misunderstanding, and that misunderstanding is fanned by secrecy and ignorance."

Some Notes on the Conduction of Laboratory Work in Pharmacognosy[1]

RALPH BIENFANG
School of Pharmacy, University of Oklahoma

Instruction in pharmacognosy at Oklahoma may be considered to fall nominally into five interrelated classifications; lecture, formal laboratory, informal laboratory, outside preparation and reading, and quiz. It has been the writer's aim over the years to integrate these branches of instruction so that, not only the individual course, but the entire required curriculum of ten hours might be presented as a single unit.

[1]Read before the Conference of Teachers of Pharmacognosy and Pharmacology at the 1938 Minneapolis meeting.

For that reason I have no pharmacognosy laboratory course to describe, but rather must confine my remarks to laboratory in pharmacognosy courses.

The skeletal structure for all instruction, including the laboratory, is the *Pharmacognosy Workbook*, which provides a uniform, and I think a logical, routine for the consideration of the vegetable drugs. For the basis of these remarks, then, I shall lift out from the curriculum those directions and notes which may be said to come under the headings, formal laboratory and informal laboratory.

In Course 1, called Drug Plants, items of that nature would be the map of vegetative conditions, collection of a drug plant, ascertaining the structure of its official part, sketching of leaves and flowers, and experiments dealing with family and genus generalities, cell contents possessing form and structure of morphological parts.

At the outset of the course, for the purpose of better understanding the range of growth and spread of drug plants, each student colors a world map, with legend, showing the various vegetative conditions that prevail. The drug plant, one that is official, is to be collected (with permission) in flower if possible, and brought to the instructor for discussion. Later on in the course, a section of the official part of this same plant is prepared by the student for microscopic observation. Leaves and flowers are sketched in detail, some from life and some from charts. Various experiments designed to illustrate pharmacognostical generalities of plant families and genera are conducted, such as the demonstration of the presence of volatile oil in the members of the Pinaceæ, Zingiberaceæ, Aristolochiaceæ, etc., calcium oxalate in raphides in lilies and madders, and in styloids in irises, etc. The microscopic appearance of oils, starch, aleurone, hesperidin, cystoliths, etc., is covered. Finally the microscopic structure of morphological parts is undertaken and completed with an unknown. All through Course 1, an individual habitat may (see *Workbook* sheet) is properly colored for each species.

In Course 100, Plant Drugs, less informal laboratory work is given, but there is much more formal work. On the informal side may be mentioned the collection and preparation of ¼ pound (dry weight) of an unground drug. This, after acceptance by the instructor, is comminuted and microscopically examined. Formal laboratory work comprises organo-

leptics, morphology, microscopy, qualitative chemistry, microchemistry, and miscellaneous experiments such as capillarity, foam number, fluorescence, vein-islet number, and palisade ratio.

In connection with organoleptics, the writer has recently developed a method for the fixation of odors on paper, thus making possible the recording of odors in the *Workbook* by students. This in brief consists of mixing a few drops of No. 88 cellophane-acetone solution with a drop of the volatile oil concerned, and transferring the resulting mixture to the page, where after a few moments drying, it becomes a record of considerable permanence.

Concerning morphology of unground drugs, I have lately had correspondence with Wallis on a point which may be of some importance. Whereas in our measurement of leaves for instance, we have a minimum and a maximum length and a minimum and a maximum breadth, it seems as though these four figures might profitably be replaced with one, a length-breadth ratio. This length-breadth ratio might also be applicable to seeds and fruits. In the case of leaves the ratio would refer, of course, to the lamina.

The "unknown" approach is wholeheartedly believed in and applied. Keys are given, and unknowns appear after each major step in the courses. In all cases, identity is begun by determining the morphological part represented.

Lest it appear that morphology is being overemphasized, allow me to point out that the *Workbook* is arranged systematically and that both the qualitative chemistry and the microchemistry phases are approached through a chemical classification.

For arrangement and content of laboratory work I have drawn heavily upon Moritz, Wallis, and Wasicky. For individual ideas and experiments I have drawn freely upon all of my esteemed contemporaries both in this country and abroad.

The Teaching of Laboratory Work in Pharmacognosy[1]

HEBER W. YOUNGKEN
Massachusetts College of Pharmacy

The exact nature of a laboratory course in pharmacognosy, in my opinion, should be dependent mainly upon three factors, namely, the time allotted by the institution, the facilities provided, and the character of the preliminary training of the class in the basic sciences of botany, chemistry and zoology.

I think it will be generally agreed that the principal objectives to be attained in the laboratory course in pharmacognosy are:

1. Knowledge of methods of examination, identification and valuation of drugs.
2. Ability to use intelligently a good microscope, the ocular and stage micrometers and the other necessary accessories and reagents.
3. Acquaintance with every crude vegetable and animal drug that the pharmacist is likely to sell or dispense.
4. Ability to detect the presence of adulterants, even though the exact identity of these may be obscure.
5. Ability to read intelligently and interpret the monographs on vegetable and animal drugs in the United States Pharamcopœia, the National Formulary and the Dispensatory.

As to how these objectives are to be best accomplished is a most important problem. I am convinced it could be simplified and the objectives more readily accomplished, if some of our institutions would require a more adequate basic training in botany, general chemistry, zoology, and especially in non-protoplasmic cell contents, plant and animal tissues, and drug-plant taxonomy before admitting students to the professional course in pharmacognosy.

Unless this is done, the task of the teacher in completing the course in the minimum time allotted by the present syllabus is made difficult, no matter how great his enthusiasm or his inspirational ability.

My experience has been that to accomplish satisfactory

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[1]Read before the Conference of Teachers of Pharmacognosy and Pharmacology at the 1938 Minneapolis meeting.

results, the teacher must be active in the laboratory among his students. It is not enough to give out the materials, assign the lesson and then expect the average undergraduate student to get that lesson. If sufficient headway is to be made, students should receive some laboratory assistance, receive representative samples of drugs and good sections and powders. An abundance of illustrative material in the laboratory will be found valuable in stimulating the student's interest. This material should consist of charts, blackboard sketches, maps, choice specimens of authentic crude drugs, adulterants, and substitutes, herbarium sheets of medicinal, spice, and dye plants, and reference works.

Assuming that the student in laboratory pharmacognosy has had the basic training indicated, I believe the taxonomic system of classifying drugs to be the best because of its orderly and scientific form. As an introduction, I have found the morphological system helpful as a means of teaching vocabulary, terminology, parts used, order of sequence in the study of drugs representing various plant organs, and the histological elements that might be expected in powdered roots, stems, leaves, flowers, fruits, and seeds.

I believe it good practice to teach the macroscopical and microscopical aspects of each important drug together. The study of the histology of the crude drug should precede that of the powdered drug, and the tissue elements observed in the powdered drug should be correlated with their positions in the transverse and longitudinal sections. The study of transverse sections are helpful in identifying pieces of crude drugs but are not enough for identifying most powdered drugs. For these the study of the longitudinal sections is practically indispensable if students are to be taught the character of the elements to be found in a given powder.

The definition of the drug and at least certain aspects of its purity rubric should be kept before the student as he studies the whole drug, its sections and the powder. Aconite may be taken as an example. "Not more than 5 per cent of its stems and not more than 2 per cent of other foreign organic matter" is permissible. In this case sections of Aconitum napellus stem as well as root should be examined before powdered aconite is studied.

Microchemic, microsublimation and precipitation tests also have an important place in laboratory procedure and should be stressed. The student should be given laboratory practice

in applying the common microchemical reagents and interpret the results obtained with them. A moderate amount of practice should be given the student in the isolation of constituents from crude or powdered drugs and their subsequent identification by microchemical tests.

I believe it good policy to require students to record their observations by means of carefully labeled sketches, but I do not consider it necessary for them to sketch every drug section or the elements in every powdered drug they examine. The amount of such work exacted of the student should be in keeping with the time available for such work in the laboratory and not be greater than the capability of the majority of a given class. Every experienced teacher usually has his or her types of drugs for the more detailed microscopic study.

Some attention might also be given in the laboratory to the application of ultra-violet light in the identification of drugs. I have found this phase of pharmacognosy especially attractive in stimulating the student's interest.

With the increased use of glandular products in therapy, it has become very important that steps be taken to give laboratory training in this phase of pharmacognosy. I believe this training should include the following:

1. A preliminary study of teased and appropriately stained preparations of animal tissues obtained from cattle, sheep or hogs and should include epithelial, connective, muscle and nerve tissues.
2. Demonstration of whole glands of animals used as drugs and of all United States Pharmacopœial and National Formulary glandular products.
3. Examination of appropriately stained sections of glands of cattle, sheep, or hogs that are used as drugs.
4. The technique of staining and mounting powdered and desiccated glandular products.
5. A detailed study of at least two of the simpler types of powdered and desiccated endocrine glands.
6. Determination of the presence of skeletal muscle and of excessive connective tissue in powdered and desiccated glandular products.

Teaching Salesmanship[1]

JOSEPH H. GOODNESS
Massachusetts College of Pharmacy

There is a pleasant illusion among men in the practical world that professors are a harmless, absent-minded, slightly impractical species of the genus homo. In a quick analysis of teaching institutions these men too often catalog schools as the place where high theory and great-fuss-about-trivial-things dwell, and where professors indulge in gross oversight of many things practical and basic. It is in this strain that we sometimes hear these men refer to schools as "where you don't learn half of what you need and do learn eighty per cent of what you can forget." Similar expressions are used by the doctor, the pharmacist, the lawyer, the engineer and others in referring to his school, for usually he finds upon graduation that his training is incomplete without additional hospital, store, office, or field experience. Let us see whether or not there are any foundations to these derogatory claims.

Those of us who teach, know, of course, that it is impossible to teach by specific examples everything that each student will meet in practice, and exclude all examples that each student will never meet. Therefore, if this is the basis of the complaint, it is unjust, for the school, the teacher, must teach principles rather than repetitious details, the ideal rather than the border-line cases, and for the greater good rather than for individual gain. There may, however, be justification for such remarks if the school, the teacher, fails to fulfill certain obligations owed to present students—or at least to the majority of them. These obligations are not easily outlined, but they include such items as looking ahead for the educational needs of the student in his practice after graduation, a promise, expressed or implied, to instruct in that need, and a complete fulfillment of that promise by teaching the needed topics substantially and with the latest and most reliable information. If this sounds too utilitarian, it is nevertheless the demand of three out of four of our students and alumni. The teacher, the school, using the same teaching material of ten or even five years ago, or omitting needed courses of instruction altogether, is definitely failing in this

[1]Read before the Conference of Teachers of Pharmaceutical Economics at the 1938 Minneapolis meeting.

obligation. Changes in the world of science and the applied field never cease, and the schools or teachers that overlook or fail to conform with these changes rightly deserve all the criticism heaped upon them by the practical man. Moreover, sooner or later a sure and complete economic and social demise awaits those who fail to change the unfailing law of supply and demand will see to that. While the above is true of all collegiate schools, especially the professional ones, I wish to restrict this discussion to the business subjects in pharmacy schools; and even more specifically, to the subject of salesmanship. We shall, therefore, first consider the need for the subject in pharmacy schools and then the characteristics of the subject itself.

General and Pharmaceutical Need of Salesmanship

That our present high standard of living in America is due to the physical possessions and the availability of services to the common man cannot be denied. Without our telephones, transportation, homes, automobiles, fur coats, novels, movies, college education, etc., we would still be farmers in the hoe-and-horse-plow stage. That we were able to acquire these possessions and that new possessions will be available in the future is partly due to the exercise of effective salesmanship—written or oral. In our search for life's pleasures, we should be grateful to the purveyors as well as the creators of all material things and services we acquire. It is only uncontrolled childish egotism that can prompt a person or group, engaged in one step of the long chain of economic processes from production to consumption, to say that he or it is all important. If there can be any "superior" position in an economic chain of activity, it should belong to the consumer, for by simple logic it is he for whom the entire chain of economic activity exists. We cannot deny that for the greatest good (as we understand it), for the greatest number, for the longest time, we definitely need salesmen as well as manufacturers.

To prove that there is need of salesmanship in pharmacy, and, therefore in schools of pharmacy, let us look to the findings of three independent surveys, each made for purposes other than the use to which we now put them. The first of these is the survey made by Dean Howard C. Newton in 1932 at the School of Pharmacy of Creighton University. The survey sought information needed for the construction of a new

pharmacy curriculum. By communication with 250 alumni, Dean Newton discovered, among other things that 190 alumni or 76 per cent of those answering were engaged in some form of retail drug store practice. They thought and suggested that salesmanship was of primary importance as a business subject in the new curriculum. Such conclusive findings more than prove the point and should not fail to influence all curricula builders.

The second set of statistics were compiled by Doctor C. O. Lee of the School of Pharmacy of Purdue University and can be found in the July, 1938, issue of *The American Journal of Pharmaceutical Education.* In his study, Doctor Lee sought the relationships existing between earnings, scholastic records and the findings of orientation tests of the school's alumni. In one part of his study he quite incidentally discloses that 64 of the alumni, whose questionnaires were complete, pursue 6 different divisions of work (a seventh division of wage-earners consisting of 8 student appointees to scholarships are excluded from this calculation on the recommendation of the author). Of these 6 groups, 4 were engaged in retail drug store practices. Forty-three of these 4 alumni groups spent their working hours as managers, owners, assistant managers, and clerks of drug stores. This shows that at least 67 per cent of the Purdue alumni reporting can be found in retail practice. While Doctor Lee does not mention business subjects or salesmanship in his survey, he does show that 23 of the 43 alumni were employed as clerks. If we can assume that the American plan of advancement is from bottom to top on a basis of work well done, we can again see the definite need of salesmanship as a subject in pharmaceutical curricula. It might be added here that any teacher in a school of pharmacy knows that an even greater number of the alumni than is indicated by the two findings enter retail drug store practice. The findings of both surveys is calculated on total answers received, and not upon the total number of alumni, which fact is responsible for the lower percentages.

As further proof of the need of salesmanship in pharmacy schools, let us analyze the activity-structure of the average drug store. Again relying upon an independent investigation, the St. Louis Survey, it is seen that independent drug stores studied received 18.9 per cent of their business from the prescriptions (manufacturing and professional) department, the chain stores received only 3.9 per cent of their sales from

this department, while all stores together averaged only 16.59 per cent of their total sales from prescriptions. The remaining sales, 83.41 per cent of the total, were the result of plain selling. What more impressive proof, than that 75 per cent of our alumni are engaged in an 80 per cent selling activity to earn their living, can there be for the need of salesmanship courses?

Going further, when we discover that from 25 to 35 per cent of the prescriptions compounded today call solely for ready-mixed and often ready-bottled proprietaries and specialties, all of which make no greater demand of professional training than identification, we can honestly say that this part of professional (prescription) work is also plain vending or selling. For the final logical proof that salesmanship is necessary, we need only to remember that there can be no profit or even income in any profession or calling until a sale is completed.

Some of us may be surprised at this "83 per cent vending" figure and advance the oft-repeated panacea that pharmacy would be better off if some, if not all, of the side-line selling was abolished. The ineffectiveness of this proposal can be seen on considering what would happen if all, every one, of the druggists restricted their activities to the professional department. The sales of the average store would drop to one-fifth their present volume and make it impossible for more than one-fifth of the druggists to remain in business. This would mean only one-fifth of the schools and one-fifth of the teachers would be needed. (We know, of course, that a few individual cases of retail specialization in professional work do not follow the same rule.) I believe that the statistics quoted on alumni and the nature of retail pharmacy prove beyond a shadow of a doubt that pharmacy schools should teach business subjects, especially salesmanship. Please let it be understood that while at least two out of three alumni need, and, sooner or later express their desire for business training, none of them demand or require a decrease of scientific courses. They all know that the effectiveness of salesmanship is immeasurably increased by a mastery of the principles taught them.

If our curricula builders are not yet convinced of the need of business subjects, especially salesmanship, in schools of pharmacy, let us consider the situation from a moral and ethical view. Today 45 of our 48 states have prerequisite

laws. These require graduation from a school of pharmacy of every applicant to a state board of pharmacy examination. In other words, the school, often being the only pharmacy school in the state, has a distinct monopoly. In that position it is practically the sole supplier of future pharmacists for the state, and therefore, has the moral and ethical obligation of supplying fit individuals to carry on future pharmaceutical practice.

Since schools of pharmacy cannot change the preponderance of selling or "commercialism" in drug stores, it is their duty to at least make available needed business courses to their students. Whether these courses are compulsory or elective is a secondary consideration; they should, however, be offered in the schools, and the student should be allowed a free reign in his choice of them. Schools should not subtly penalize the student who wishes to study business subjects by such methods as higher tuition fees, a decreased hour-credit rating, the establishment of indivisable curricula which do not include the business subjects, or in any other way. Let those who disagree with this conclusion consider for a moment the conflict which must arise within the student who has been taught to look down on commercial practices when he finds upon graduation that the only position available to him is one in the commercial field, that is, in the retail practice. Unless commercial subjects are offered at the school, at least two out of three alumni can come to but one or both of these conclusions: first, that the profession has deteriorated beyond hope, or second, that the school is backward. Whichever conclusion he reaches, his state of mind is not conducive to good citizenship, happy living, or participation as an alumnus.

By some unfortunate coincidence, educators who do not believe in business subjects, when addressing laymen, too often scoffingly disclaim any connections with the commercial type of pharmacy—generally the only type with which the layman is familiar and within whose walls he sees hanging the diplomas of the schools' alumni. One wonders how the layman reacts to all this. To sum up, it seems that no sole school of pharmacy in a state having a prerequisite law can equitably and reasonably divorce itself from all business courses, especially salesmanship.

Character of Salesmanship

As everyone knows, salesmanship as practiced today is

of two types. There is first the "high-pressure" type which no one will doubt can be very obnoxious, for there is hardly a person alive who has not been irked to discourtesy by the selfish tactics employed in such selling. The second type is that of helpful selling which has contributed so much to our civilization and advancement. This helpful selling is both informative and psychological. It recognizes the need of economy for the average consumer as well as the need of that mental satisfaction which should accompany every business transaction or exchange; and of the two, it recognizes mental satisfaction as the greater force. It recognizes that each consumer should be allowed a play of individualism, and that he should not be coerced into buying the X-brand of something, because it is scientifically as effective and cheaper, when the consumer feels more important and happier in buying the M-brand. This salesmanship recognizes that so long as we maintain our system of capitalistic economy there should be no group intervention influencing buying, except for those too poor or those incapable of arriving at their own conclusions. Fraud is never tolerated by salesmen who practice this second type of selling.

It is quite natural, because of self-preservation, that a pharmacy graduate, untrained in good salesmanship, may practice high-pressure selling, especially when the economic pressure of his overhead expenses and competition demand a fairly high minimum of sales for economic existence. If his sales are not accomplished ethically and by the use of good salesmanship, as a last resort he may take to unethical practices, which include high-pressure selling. Every educator in touch with the practical world has seen at least one such sad case.

Before considering the ideal salesmanship course, let us examine very briefly some of the peculiarities of retail drug store selling. Retail selling more than any other type is built upon a foundation of confidence in the salesman, not only because the materials purchased are often to be used medicinally, about which the consumer realizes his lack of knowledge, but also because the average druggist must draw his customers from a limited trading area, because competition is very close, often next door, and because sales are small and repeat sales are imperative to existence. Pleasing the customer is, therefore, most important in retail selling, and pleasing the customer means a knowledge of psychology.

Teaching Methods

An analysis of methods employed in teaching salesmanship reveals several, the first of which is the use of visiting lecturers. From experience it seems that this is a poor method of teaching, since these speakers are usually excellent doers, but too often poor teachers. Also, because they are seldom allowed sufficient time, due to the pressure of teaching schedules, they usually fail to fully develop their understanding of selling. An attempt to rectify this by increasing the number of lecturers only adds to the confusion, for without a predetermined plan uniting all the talks in full, there is much repetition, as well as conflicting opinions from one speaker to the next. All in all, the method, while better than no course at all, is the poorest method of teaching the subject.

The second method of teaching salesmanship is by the use of demonstrations. The sales demonstration as now used may include the student as a participant or it may leave him as an observer. In any event, the entire performance becomes a play by amateur actors. It always leads to a set conclusion. In the demonstration the buyer is acting as an average buyer, a nonexistent creature, or as a buyer of a particular type (as the actor sees him) and so, because he has in his own mind a prearranged conclusion, he will either "buy" most abundantly, or refuse to "buy" irrespective of the logic, bargain, or natural effectiveness of the circumstances urging a purchase. Neither his pocketbook nor his need impel or restrain him in his buying. Throughout the sale his attention is not on the goods or the clerk, as an actual customer's attention might be, but on his lines.

If the student is acting as clerk, he must assume the existence of certain emotions from the words the buyer uses; a very unsatisfactory situation, for seldom indeed is the buyer a sufficiently fine actor to accomplish this. In actual selling, not only the words, but all of the customer's bodily actions and their natural timing have great significance. A shifting of weight, a facial expression, an eye movement all mean much. This demonstration method of teaching focuses the student's attention during the sale on the goods and perhaps on a few fixed selling formulas, rather than upon the customer's mind, where it should be. It must be admitted, however, that this method is not without advantages. As now used it is a good test of acquired skill in courtesy,

and of the ability to meet customer's objections to the merchandise, but it can never be an honest substitute of actual practice which it is supposed to imitate. It should be remembered by those who teach, that customers buy by emotion as much as through reason, and that emotions are personal, not easily standardized or acted. Here again, although not the ideal method of teaching salesmanship, it is far better than no instruction at all.

The third method of teaching salesmanship is by lectures. In some schools these lectures are of the inspirational type, while in others, they are scientific. In schools where the inspirational type of lectures are used the teachers fail to utilize the thousand-and-one scientific principles and statistics which are now available to them. Their lectures are built around such mottos, even if not expressly used, as "If at first you don't succeed, try, try again." They speak in generalities of service, quality and ethics, but give neither principles nor examples of them. They focus all attention on the clerk's own feelings and determinations and not upon those of the customer. They seek to make the clerk feel important rather than the customers. It is my firm opinion that such lectures ruin rather than make good clerks.

In the lectures with the scientific approach, the material follows closely the actual means employed in good practice. A few first lectures are devoted to the most common type of retail selling, generally referred to as order-taking. During order-taking, the clerk makes no attempt whatever to stimulate greater appreciation of the item purchased nor to increase the sale. For such selling, the clerk needs to know only the common courtesies—he must be pleasing, intelligent, and responsive. These lectures are directed at the clerk, his personal and mental make-up, and explains why only a few lectures are necessary. The second and most important part of retail selling is truly salesmanship. Here the salesman must have his attention focused not upon himself, for he must feel natural, but upon the mind of the customer. He must subjugate all, the goods, the price, the very sale itself, to the mental workings of the customer. To those who resent a salesman's open discussion, he must be able to tactfully suggest new uses, better savings, greater effectiveness, greater enjoyment, and more self-appreciation in the consumer so that all these are "discovered" by the customer himself. He must avoid customer irritation. He must be

able to detect not only the receptive or nonreceptive condition of the mind as the suggestions are made, but also whether the suggestion itself, its method of presentation, and its timing are perfect. All of this is, of course, in the realm of psychology; the emphasis is on personality, the customer's personality, and not upon goods or the clerk's own feelings.

The scientific courses of the school will have provided the graduate with a background for an understanding of the goods, but if no salesmanship or certain substitute courses are taught, where is the pharmacy graduate to learn about the personalities of "the other fellows," his employers and his customers. Since in most of life's activities, social, economic, and private, we have the two-humans-and-an-idea situation, the omission of the study of the other fellow (which means all humans) will be a serious loss to the training of the pharmacist who must in his vocation as retailer deal with countless people. Lectures on salesmanship should, therefore, include discussions of likenesses of humans in their mental makeup, as well as the causes and the nature of individual mental differences. Salesmanship courses of this type are really applied social sciences, and provide not only the means of effective dealing with customers, but of the ability to please all humans with whom the graduate shall come in contact.

On the grounds already discussed, it would seem that the psychology lecture approach in teaching salesmanship is very nearly ideal. Its adoption, of course, requires the services of one well trained in social sciences as well as pharmacy. Just anybody cannot teach salesmanship any more than he can teach chemistry. Courses in general psychology, if not too much on the physiological side, are good substitutes for salesmanship in the curriculum. Although there are several textbooks dealing with retail selling, very few of them attack the subject from a scientific approach, which is another reason why a teacher well trained in the social sciences is an invaluable assets to the faculty of a school of pharmacy.

In conclusion this paper is an appeal for three things; first, the introduction of business subjects, especially salesmanship, whether as compulsory or elective courses, in all undergraduate schools of pharmacy; second, a plea for greater utilization of scientific facts and statistics in teaching salesmanship; and third, the abolition of all examples of high-pressure selling in the illustrations of good salesmanship.

Commercial Ethics[1]

ROLAND T. LAKEY
Wayne University, College of Pharmacy

We are justified in taking a large amount of pride in the institutions of government which our civilization has nurtured. It is not until we attempt the evaluation of results of this awakening of social consciousness that we are compelled to adopt some system of appraisement in order to discover whether its provisions are equitable in character.

We find that different kinds of yardsticks are required to measure social progress. Perhaps one of the best mediums for measurement is the code of ethics to which any group subscribes.

In spite of the numerous evidences of periodical recessions and advancements, we observe more or less steady gain towards the idealistic standards embodied in our various codes of ethics. These are the crystallized expressions of our collective thinking relative to proper group conduct. That we individually fail to live up to the letter of the code does not destroy the value of its provisions for guidance.

As revealed in its ethics our civilization has recognized the worth of certain standards for the control of the individual, the family and the nation. In their primitive form they were the first products of social evolution and they have undergone refinement to meet new needs as they arose. The early origin of professional codes indicates that the individuals engaged in rendering important services to society voluntarily adopted rules of conduct commensurate with the responsibility they accepted.

Due to its late development in the course of human affairs our commercial system has not established a formal code comparable to those which govern our actions in other spheres. The unfair practice of "caveat emptor", a remnant of the barter system of trading, still appears to be our guiding principle in commerce. Because the retail pharmacist attempts to provide a comprehensive mercantile, as well as a selective professional, service he is in an advantageous position to lead a movement to establish a code of ethical commercial practice more in accordance with our other rules of conduct.

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[1]Read before the Conference of Teachers of Pharmaceutical Economics at the 1938 Minneapolis meeting.

The pharmacist assumes a definite relationship to the public's health when he receives his license to practice. This guardianship implies that he will use his specialized knowledge and his professional training to safeguard his patrons from the fraudulent and nefarious practices of the exploiters of the unfortunate victims of sickness.

Because his position is favorable for meeting more people of all income levels than any other person serving health interests, he could do a great deal of good for society if he would take a bold stand and refuse to be a party to the "quasi fraud" so often associated with the sale of secret formula as well as downright worthless preparations. The makers of these troublesome stepchildren of the drug industry have dominated the commercial trends of retail pharmacy. They have alienated us from our natural colleagues; they have aligned us with the charlatan and the quack; they cause some of our accepted-as-representative associations to devote valuable time and to enlist in a strange crusade for the sole purpose of covering up their unsocial practices with a pseudo-professional attachment. We have gone to great extremes to help them to protect their invested interests. Is this attitude one of business expediency or of professional hyprocrisy?

At the turn of the century we enjoyed the homely philosophy of Mr. Dooley, a creation of the humorist, F. P. Dunne. Mr. Dooley, with his tongue in his cheek, speaking of hypocrisy, says:

"It must be a good thing to be good or ivrybody wudden't be pretendin' he was. But I don't think they'se anny such thing as hyprocrisy in th' wurruld. They can't be. If ye'd turn on th' gas in th' darkest heart ye'd find it had a good raison for th' worst things it done, a good varchous raison, like needin' th' money or punishin' th' wicked or tachin' people a lesson to be more careful, or protectin' th' liberties iv mankind, *or needin' th' money.*"

"Needin' th' money" no doubt is the anesthetic which lulls us into blissful ignorance of the inconsistency of our professional pretenses and our commercial practices.

There is no special stigma attached to the commercial expansion of the drug store providing that part of its service which deals with the public's health is conducted upon as high an ethical plane as such commercialized professional service demands. It is an insult to the intelligence of our carefully prepared, socially conscious and scientifically equipped phar-

maceutical graduate of today to ask that he comply with any other standard of commercial conduct.

We should take the necessary steps in our professional organizations of pharmacists, board members and educators to establish an equitable code of commercial ethics which will protect the health interests of our patrons and fight for the proper legislation to control individual compliance.

The Teaching of Commercial Pharmacy

ROBERT W. MORRISON
School of Pharmacy, University of South Carolina

For convenience of study, four main divisions are made; 1, drug store management, merchandizing, and the making of the inventory; 2, pharmaceutical jurisprudence, both state and federal; 3, proprietary products both for prescription purposes and for over the counter call; 4, store decoration and the methods of displaying merchandise.

The commercial and professional have become so intimately related in modern pharmaceutical practice that the public expects the pharmacist to supply articles not only of a professional, but also of a commercial nature and to be fully conversant with the nature and uses of each. It is on this basis that the instruction in the fundamental principles of merchandizing, salesmanship and inventory taking is planned.

In the study of the legal problems which concern the druggist, the case method is used. The druggist's responsibilities in connection with the filling of narcotic and exempt narcotic prescriptions, the sale of poisons, and the proper keeping of records of all kinds is stressed.

There are approximately six thousand manufacturers of chemical and pharmaceutical products in this country. Each manufacturer places from one to several hundred items upon the market. The total number of preparations which go upon the drug store shelves is therefore enormous. To familiarize the student with all those he may meet in prescription compounding is an impossible task. How we have approached the problem of instruction at South Carolina may be of general interest.

Several years ago we began the collection of the products of a selected group of manufacturers. We found them very cooperative. Very complete lines were obtained and the stocks

have been added to and have been replaced from time to time as needed with no expense to the institution. The products are classified on a therapeutic basis and students in their study follow the therapeutic classification. The laboratory method is used. Blank forms are furnished the student as well as the necessary literature from which he can obtain the desired information. The student records the name of the preparation, the manufacturer, his location, the form, the size and kind of container, the formula, the chemical nature, the cost, whether Council accepted, dosage, method of administration, action and uses, the Pharmacopœial and Formulary equivalents and any other items that may be of interest. Weekly discussion groups are held by the instructor. Through the cooperation of sympathetic pharmacists the student is given the opportunity to read the prescriptions in the local drug store. Obviously, it is impossible to retain all the information about every article studied but the practice of looking up and recording complete data is good training. The work is open only to seniors.

Window, counter, and showcase decorating and displaying cannot be taught by the lecture, library and demonstration method alone. The laboratory method is also necessary. The student is provided with scissors, hammer, tacks and various types of decorating material and is set to the task of decorating under adequate supervision. Students work in pairs, and are required to decorate a definite number of windows and cases during the course. Each team installs twenty windows requiring different types of arrangement and color displays. Emphasis is placed upon originality in design and color blends. Both merchandise and professional displays are made, and displays featuring special days are constructed. The better windows are photographed and prizes given. The students are also given experience in decoration and display in the various types of local drug stores.

A practice drug store has also been stocked with prescription ingredients and the usual sundries and cosmetics found in a modern drug store. It has also been equipped with a telephone system for prescription practice. This type of training should be of great value in familiarizing the student with drug store methods and making him feel at home when he enters a store where he must serve both the profession and the public.

The Use of the Library for Undergraduate Study[1]

WILLIAM A. JARRETT
College of Pharmacy, Creighton University

Years of experience has impressed upon me the many problems confronted by students entering upon college work. As a result I have constructed a course which is required of all freshmen from which excellent results have been obtained.

Modern education has attempted to "sugar-coat" learning to such an extent that one of the big problems is to get students to think or reason properly.

In elementary arithmetic, for example, children are taught to look for key-words which tell them whether to multiply or divide, subtract or add. In learning to spell it is no longer necessary to know the alphabet. They learn to spell by word pictures. Considering the poor mathematics and miserable spelling of many college students, I wonder if all of our modern methods speak for progress.

"Fundamentals of Study" is the title given to this one hour course. I introduce the work by defining education in the language of such earlier scholars as Socrates, Plato, Aristotle, Locke and Rousseau. I then present the following definition as being most satisfactory: Education is the adjustment of the individual to his personal and social heritage through an informal acquisition of adequate skills and information, or of formal discipline of the mental, emotional, moral and physical faculties.

The use of the dictionary and care in spelling and in understanding is stressed. Using the library and textbooks, listening to lectures, acquiring skill, note taking, memorizing, preparing papers, reviewing, taking tests and preparing a study schedule are the main subjects discussed in this course. The first topic considered is, Using The Library because I believe if we wish to make students instead of robots there is no better place to start than in the library.

Universities were originally collections of books and not stadia or palatial dormitories. Howard Vincent O'Brien, author and feature writer has recently said: "We have grown confused and overcomplicated in our thinking about education. An educational system would be complete that did no

[1]Read before the Conference of Teachers of Pharmacy at the 1938 Minneapolis meeting.

more than instruct its students in the contents of libraries and the use thereof."

The different departments of a library, the various reader's guides, and the card catalogues are first explained and the two major systems of call numbers, the Dewey Decimal and the Library of Congress, are then discussed. The students are advised to find out what special indices are available and how to use them. They are taught how to use encyclopedias, how to find material within a book quickly, and the value of becoming acquainted with current periodical literature. As different libraries have individual plans and regulations we study the other libraries located in the city.

My last lecture is a discussion of bibliographies. At the same time an instructor in English devotes a class period to the correct forms for bibliographical data. Library assignments, which cover a wide range of subjects with no two alike, are then made. The bibliographies are submitted for correction to the English instructor, graded, and filed. Subjects are chosen which require an extensive use of periodical literature over a wide field. Abstracts are not required but their value is emphasized.

Some may say that the use of the library should be taught to the junior or the senior class, but I disagree and I know that if freshmen are given this instruction during their first semester they profit by it during their college life as well as after graduation. When freshmen discover that a library is a general laboratory work shop or study hall where they can go to look up an answer, prepare a theme, or solve a problem they soon learn that the quiet, scholarly and purposeful atmosphere of a reading room is an unconscious encouragement to serious and concentrated effort. Its use becomes a habit and soon it follows that all reading becomes study.

While most of my remarks apply to the use of the library with respect to study relative to their college course, I have found that many students have also developed a keen enjoyment in reading such literary works as fiction, poetry, biography and travel. Students repeatedly tell me that while working on assigned bibliographies they have run across other material which has so intrigued them that many of their leisure hours have been used reading.

The laboratory work of the course consists of an afternoon in one of our libraries. Last year the city librarian gave the class a talk on "Aids to Library Work" and showed them the

practical arrangement of the library stacks and reading rooms. This was followed by a round-table discussion of the rules of the library, the value of periodicals, and the importance of avoiding loss of volumes. She endeavored to stimulate interest in the library as a cooperative concern which is operated for the benefit of the students. The students were shown what a tremendous investment of funds the library represents as well as the difficulties involved in building up and maintaining an adequate collection.

It has been a pleasure to note how responsive and interested the students become and how really cooperative they are during their attendance at college. This personal relationship established early with the new student develops his enthusiasm, interest and pride in the library and is a large factor in obtaining cooperation and good morale.

If we wish to inoculate our future pharmacists against the danger of dictatorship, we should do it, not by propaganda, but by the method of instruction calculated to develop minds capable of independent action. Texts are written by human beings who are subject to err and when the freshmen are taught to read from several books they discover that learned men differ among themselves concerning the significance of events of history, or facts of geography, or political systems, or even in matters of science. Realizing this, they develop a disposition to formulate their own judgment instead of taking the viewpoints of others. In a rapidly changing science, no single textbook is adequate. Likewise, time and individual limitations, and prejudices prevent lecturers from covering a subject completely. Class lectures should be used primarily to interpret principles, to bring about correlation between subjects and to explain information not yet available in print. In addition, lectures should inspire and stimulate students to individual activity. The student should learn to seek his own sources and be trained to look for answers to his own questions. Upon the whole faculty rests the problem of bringing the value of the library to the student who has approached the pharmacy course with the predominant thought of his skill and aptitude. The pharmacy faculty must augment the student's earlier training by stimulating student effort by special topics and problems for which the student must seek his own bibliographic aids. A well-ordered reading plan should be followed by each member of the faculty. Organization of such a plan with the constant

revision necessary to include the latest material involves a great deal of effort on the part of the teacher. References should be given so that the student may know alternative methods or theories. This will give him training in evaluation of the material he reads so that he will not accept without reserve the theories that are proffered him after graduation.

A broader form of education tending away from strict adherence to professional training should prepare the pharmacists of the future for better civic and professional responsibilities. The library assumes an important role in this leadership training.

Observations of Pharmaceutical Arithmetic Problems, Student and State Board Examinations[1]

CARROLL B. GUSTAFSON
Massachusetts College of Pharmacy

Students of pharmaceutical arithmetic do find certain types of problems more difficult of solution than others.[2] Do students receive sufficient practice with difficult types of problems? Are the difficult types of problems of student days found, in general, on state board examinations?

Answers to questions such as these interest teachers of pharmaceutical arithmetic. Furthermore, information along these lines may at least serve as a guide in the teaching of this subject which is considered important enough by most state boards to warrant a separate examination.

For the purposes of this study, the problems given to 226 students in three courses during the past school year were classified using an arbitrary system.

TABLE I

SYSTEM OF CLASSIFICATION

Type	1	Ratio and proportion
"	2	The common system of weights and measures
"	3	Relationship of avoirdupois and apothecaries' weights
"	4	The metric system

[1]Read before the Conference of Teachers of Pharmacy at the 1938 Minneapolis meeting.

[2]A Study of Some Problems in Pharmaceutical Arithmetic Given to Students. A.J.P.E. Vol. II, No. 3.

" 5 Relationship of the metric and common systems of weights and measures
" 6 Thermometer scales
" 7 Calculation of doses
" 8 Reducing and enlarging recipes
" 9 Density and specific gravity
" 10 Weights and volumes of liquids
" 11 Stock solutions
" 12 Percentage and percentage solutions
" 13 Dilution and concentration
" 14 Alligation
" 15 Chemical problems
" 16 Advanced commercial problems

The total number of students who were given each type of problem, and the number of those students who solved that type of problem satisfactorily were found from examination and recitation records. From this data the percentage of the group who solved each type of problem correctly was calculated, and each type given a rank or number based on a comparison of these percentages.

TABLE II

COMPARISON OF TYPES OF PROBLEMS

Type	Per Cent Correct	Rank	Type	Per Cent Correct	Rank
1	85.6	2	9	73.8	10
2	68.4	14	10	68.6	13
3	71.4	11	11	78.8	7
4	75.6	9	12	63.7	16
5	66.9	15	13	80.9	6
6	88.3	1	14	81.6	4
7	82.8	3	15	81.5	5
8	68.6	12	16	78.5	8

The above table is based upon the study of the 404 problems given to the three classes during the school year.

In order to determine whether the courses in pharmaceutical arithmetic as given had stressed practice on the types of problems which seem to be the most difficult, a tabulation and classification was made of all problems that have been given to students during a number of years. The percentages of the whole number for each year for each type were calculated and compared with similar calculations based on a previous study of eight hundred and twenty-one problems found on sixty-nine state board examination papers.[3]

[3]Some Observations Based on a Study of State Board Examinations in Arithmetic, Carroll B. Gustafson, Annual Meeting of Boards and Colleges, District No. 1, April 1937.

TABLE III

COMPARISON OF PROBLEMS GIVEN TO STUDENTS AND STATE BOARD PROBLEMS

Type	School Year					State Boards
	1933-34	1934-35	1935-36	1936-37	1937-38	
1	1.6	3.5	2.8	3.6	1.7	0.1
2	7.6	8.4	6.2	7.4	3.5	2.8
3	7.5	9.9	6.6	6.7	3.7	7.8
4	6.0	5.0	5.4	6.1	3.7	2.4
5	10.9	7.7	7.4	8.0	5.4	10.5
6	3.0	3.9	3.7	3.6	1.5	8.3
7	6.5	7.1	6.5	6.7	3.5	6.9
8	3.9	2.4	3.4	4.3	2.2	1.9
9	4.9	6.1	4.0	5.1	3.7	5.5
10	8.2	8.4	7.4	8.8	9.2	6.9
11	4.3	3.2	4.2	4.0	6.2	5.4
12	13.5	11.3	14.9	13.3	20.8	17.9
13	4.9	6.7	4.6	5.4	10.6	7.4
14	4.8	8.4	10.8	5.7	7.7	3.4
15	6.5	4.9	4.8	5.4	3.7	4.1
16	5.8	3.0	7.3	5.8	12.9	8.5

SUMMARY

1. Statistics on problems in pharmaceutical arithmetic given to 226 students in three classes during the past school year have been collected and tabulated.

2. These statistics show that students found the following six types of problems of decreasing difficulty in the order given:

Type 12 Percentage and percentage solutions
" 5 Relationship of the metric and common systems of weights and measures
" 2 The common system of weights and measures
" 10 Weights and volumes of liquids
" 8 Reducing and enlarging recipes
" 3 Relationship of avoirdupois and apothecaries' weights

3. Statistics on the number and type of problems given during designated years have been compiled and compared with similar compilations from a study of state board examinations in arithmetic.

4. A comparison-rank or number has been found for the percentage of the total number of problems for the year for each type, the percentage of the total number of problems of classified types found on state board examination papers, and the percentage of correct solutions for each type given to students during the year.

5. A study of these ranks or numbers indicates for the papers and problems studied that state boards have stressed the following six types in decreasing order of emphasis:

Type 12 Percentage and percentage solutions
" 5 Relationship of the metric and common systems of weights and measures
" 16 Advanced commercial problems
" 6 Thermometer scales
" 3 Relationship of avoirdupois and apothecary weight
" 13 Dilution and concentration

Similar information for student problems has been recorded in a table.

6. This study indicates agreement between teaching practice and State Board examinations.

Pharmaceutical Arithmetic Courses in Member Colleges[1]

CARROLL B. GUSTAFSON
Massachusetts College of Pharmacy

This study had its beginning in the unsatisfying thumbing of a few college catalogues for information as to what other schools teach in courses of arithmetic for pharmacy students. The viewpoint has been that of the prospective student who desires to know what a particular college teaches in this field as disclosed by the school catalogues.

The following topics have been considered from this viewpoint in regard to nearly the entire list of schools of pharmacy which are members of the Association, and of which catalogues were available up to August, 1938, covering the 1937-38 sessions:

1. Names used to indicate the course
2. Time allotted to the basic course
3. Year when given
4. Nature of the work given
5. Preparation required for course
6. Subject matter of the course
7. Text book used
8. Advanced and other courses offered in this field
9. The rating of the teacher

[1]Read before the Conference of Teachers of Pharmacy at the 1938 Minneapolis meeting.

10. The rank of the teacher
11. Other professorial duties
12. Additional courses or subjects taught

The study revealed the following facts:

a. That insufficient information is generally disclosed by most schools in their catalogues.
b. That courses in pharmaceutical arithmetic, for the most part, are subordinated to other subjects, in spite of the importance given to arithmetic by examining boards of pharmacy.
c. That considerable disagreement exists as to when the course should be given; how much time should be given to it; what should be taught; and what preparation should be required.
d. That the subject matter of pharmaceutical arithmetic is increasing and that progress toward advanced courses seems definitely established.
e. That teachers of pharmaceutical arithmetic are not in general specially trained for their work, but seem, as it were, drafted into service.
f. That teachers of this subject have their attention spread over too many other subjects.

An Outline of a Course in Dispensing[1]

HOWARD C. NEWTON
Massachusetts College of Pharmacy

In presenting this subject, we draw from the results of work which we did as a member of the Syllabus subcommittee under the chairmanship of Dr. L. W. Rising. In this work we found that our conception of a course in dispensing differed from that of others in many respects which we believe are important. We shall point out a few of these.

1. In our outline we assume a prerequisite of other courses in pharmacy which have brought out much of the factual matter included in the present Syllabus outline under such headings as powders, emulsions, capsules, etc. It seems to us that much of that material has been given in previous courses and should not be repeated in this one. The danger of repeating such material is that of making the course a sort of anticlimax whereas we believe it should be the real climax of the curriculum.
2. Recognition is given to the fact that at least one-half of the medicine now dispensed on prescription involves a knowledge of proprietary preparations.

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[1]Read before the Conference of Teachers of Pharmacy at the 1938 Minneapolis meeting.

3. Emphasis is placed on information such as the appearance of proprietary preparations, biologicals, etc., their package units, prices and sources of supply as well as the usual scientific facts regarding these products, as such information is extremely useful in practice.
4. Emphasis is placed on the developing of a good routine procedure in filling prescriptions.
5. A study of auxiliary materials, medical appliances, etc., is included.

We feel that the course in dispensing is such an important part of the curriculum that our time is well spent in discussing the subject fully. The following outline is given in detail only where it seems that details aid in indicating the scope of the divisions of it. The course is given in the senior year. The minimal time requirement is 64 class room and 96 laboratory hours.

Dispensing is the culmination of the pharmaceutical curriculum. It is in this division of the curriculum that the wide range of knowledge gained from other courses is applied. It requires an accurate familiarity with many specific operations and facts connected with receiving, compounding, dispensing and delivering a prescription as well as a very high degree of skill in the technique involved. Its aims are (1) to facilitate the application of the knowledge gained in other courses, (2) to bring about the required familiarity with the many specific operations and facts connected with this phase of pharmaceutical practice and (3) to develop the technical skill which is so essential for success in it.

For best results, it is recommended that the laboratory work be conducted with small groups of students in a well equipped prescription laboratory, under close supervision of the instructors. Such a laboratory has a stock of the specialties of the pharmaceutical manufacturers as well as the usual stock of drugs, chemicals, and official preparations. It is equipped, also, with telephones for the receipt of prescriptions and all other facilities which are typical of the equipment of a professional pharmacy.

The subject is organized in six divisions, all of which may be given during the two semesters of the senior year or they may well be spread over the second semester of the junior year and the two semesters of the senior year. The divisions are as follows and they indicate the scope of the course:

1. General principles and regular procedures.
2. Proprietary preparations.
3. Incompatibilities.
4. Biologicals, reagents, bacteriological stains.
5. Medical appliances, sick room supplies, etc.
6. Advanced practice and review problems.

(This paper included a list of the material covered in the lecture and the laboratory work of each of the six divisions named above. Since the chief differences in the content and the conduct of the course have been stressed earlier in the article and because of limited space, these details, with the consent of the author, are not printed.—Editor's note.)

The Objectives of Quantitative Analysis in the Pharmaceutical Curriculum*

ARTHUR E. JAMES
Temple University, School of Pharmacy

I deem it appropriate, at the outset, to state my reasons for selecting this topic and to explain my relationship to it, in order that in the discussion, which I hope will follow, we may have a fruitful exchange of ideas and criticisms from those of you who are acquainted with this field. Since the speaker entered the field of pharmaceutical education with a chemical rather than a pharmaceutical background there is danger of an under-emphasis of the pharmaceutical aspects of the topic and an over-emphasis of the chemical principles involved. Perhaps this may not prove to be a serious limitation in view of the remarkably rapid metomorphosis which has been taking place in pharmaceutical education during the past decade, characterized by an increased stress upon the fundamental theoretical foundations underlying the methods used in pharmacy.

The teaching of any course centers around certain aims and objectives which constitute the ultimate justification for offering the course. Before he can do a thorough job the teacher needs to ascertain what constitutes the essential aims and objectives of the course in question and then proceed to organize, teach, and examine towards their attainment. In

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*Read before the Conference of Teachers of Chemistry at the 1938 Minneapolis meeting.

the formulation of course objectives in the pharmaceutical curriculum, guidance and impetus have come from valuable and fruitful papers in fields closely allied to Quantitative Analysis. I refer to Dr. H. G. DeKay's[1] Outline of the Objectives of Pharmaceutical Qualitative Analysis and to Dr. Carl J. Klemme's[2] formulation of A List of Desirable Objectives for Organic Chemistry as Taught in the School of Pharmacy, papers which were presented before this Association three years ago at Portland, Oregon. The major purpose of these studies was to furnish the requisite data for the compilation of objective tests designed to measure achievement. In this connection it is appropriate to emphasize again a statement made by the Committee on College and University Teaching of the American Association of University Professors in 1933 in which they stated that "It is here . . . in the field of examinations rather than classroom technique . . . that the most promising opportunities for marked improvement in general standards of college teaching seem to lie". In certain objective tests which have come to the attention of the speaker during the past year it appeared that the area of quantitative analysis was not dealt with adequately nor as thoroughly as were other branches of chemistry. Perhaps this may be attributed to the fact that as much thought and attention have not been given to this field and hence the value of extending DeKay and Klemme's work into the area of quantitative analysis is obvious.

In addition to improving standards of college teaching, Ruch[3] presents evidence showing that the use of objective tests elicits a more favorable student attitude towards examinations than does the sole use of the essay type examination. A compilation of basic course objectives may also be of significant value when placed in the hands of the student. It serves to help him to differentiate betwen essential and non-essential material and also may function, in part, as a review outline. All too frequently while the instructor is endeavoring to elucidate some critical point the student is frantically and feverishly taking a mass of disconnected, unintelligible, and over-prolific notes. The following quotation from Dr. Gegering's paper[4] entitled "The What, the Why, and the How in the Teaching of Chemistry", amplifies this thought, "The use of review outlines that stress the essentials can well serve for a large part of the student's lecture notes. The use of such an outline leaves the student free to concen-

trate on the content of the lecture. He can devote his energies to an understanding of the interpretations, explanation, associations, and correlations that the instructor endeavors to emphasize".

While it may sound somewhat Utopian and appear visionary, there is, nevertheless, the hope that when adequate course objectives have been formulated for each of the basic courses in the pharmaceutical curriculum, they may come into general use as source material, on the part of the state boards of pharmacy, in the preparation of state board examinations. This hope has been positively catalyzed by some of the reactions,[5] on the part of the National Association of Boards of Pharmacy, to the Charters'[6] "Magna Carta" of pharmaceutical education.

Before proceeding with the outline of the objectives in this paper the area to be included is limited to the introductory course involving general gravimetric and volumetric methods of analysis. The important group of physico-chemical methods and special methods used in official pharmaceutical assays is left for treatment at a future time. It is assumed that thorough courses in general inorganic chemistry and qualitative analysis have preceded the course in quantitative analysis and that a course in organic chemistry either has been completed or is being carried simultaneously.

The rapid changes, characteristic of the present era, involving the constant introduction of new concepts and of new and more efficient methods of analysis, make it imperative that any set of objectives be under continual scrutiny for improvement and revision.

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(There was presented as a part of this paper a very complete list

of the objectives of quantitative analysis in the pharmaceutical curriculum. Because of limited space the list cannot be printed in its entirety, but there is given below a tabulation indicating the main divisions and the scope of the objectives.—Editor's note.)

THE OBJECTIVES

1. Information, the mastery of essential factual knowledge.
2. Reasoning and the scientific method. The capacity to understand and interpret the fundamental principles underlying the procedures and methods used.
3. Ability to locate, utilize, and interpret the literature.
4. The development of skills essential to the performance of acceptable analysis.
5. Standards of technical performance.
6. The acceptable presentation of literature abstracts and the reports of analysis.
7. The development of desirable traits of character.
8. An appreciation of place and value of quantitative analysis.

Laboratory Work In A Bacteriology Course for Pharmacy Students

THOMAS C. GRUBB
School of Pharmacy, University of Maryland

Within recent years pharmacy schools have enlarged and improved their curricula to such an extent that the graduates of today are well equipped to enter the commercial and research fields as chemists, bacteriologists, pharmacologists, etc. With the realization that so many vocations other than pharmacy are now open to the graduate, pharmacy schools should equip their students to compete with students who have had training in other types of institutions.

A graduate wishing to become a bacteriologist may find positions in state or municipal public health laboratories, hospital or commercial medical research laboratories. The objective of an undergraduate course in bacteriology should therefore be a course which would unconditionally equip the pharmacy student to compete for such positions with students who have had bacteriology courses in medical or gradu-

ate schools. With this objective in mind, we have a rational basis for formulating the methods, scope and content of the laboratory work, which, in the writer's opinion, is far more important than the didactic work in preparing students to become bacteriologists.

HANDLING PATHOGENIC ORGANISMS

It is difficult to understand why Hart[1], who believes that the bacteriology course should fit the student for work in health department, etc., laboratories, where 90 per cent of the work entails the handling of pathogenic organisms or infectious material, should state quite unequivocally that pharmacy students should handle "only non-pathogenic material". Where else could the student better learn the fundamental rules and precautions of handling pathogenic bacteria? The writer has associated and worked with many men in the fields of milk, water and food bacteriology who rarely if ever have handled pathogenic bacteria. With few exceptions, these men will sooner or later reveal their absolute fear of handling pathogenic organisms. Quite understandably, the older these men grow, the stronger this phobia seems to become. On the other hand, those who have been taught to handle pathogenic bacteria in school are not handicapped by this phobia should their work require the use of these organisms, even years after leaving school. This emotional attitude toward pathogenic organisms constitutes a far greater mental barrier to be overcome than the learning of the increased precautions necessary in handling such organisms.

It has been the writer's observation that when students first begin to handle pathogenic bacteria, after due warnings have been issued, their general bacteriological technique improves far beyond that to be expected on the mere basis of temporal experience. Some time ago the writer carried out an investigation which involved the handling of highly virulent strains of *Pastcurella tularensis* daily over a period of a year. Knowing that over 90 per cent of those handling these organisms in the laboratory have become infected, the writer's technique was never more perfect, since one slip would have meant almost certain infection. Evidently it was an excellent lesson for the writer and the half dozen men associated in the work came through unscathed.

Hart recommends that the student become familiar with pathogenic bacteria through the use of demonstrations and

studying prepared slides of pathogenic organisms. The old proverb of "learning by doing" is excellent pedagogy when practicable, and in this case by actually transferring, pipetting and inoculating pathogenic organisms himself, the student not only learns his work better but also gains complete confidence in his own technique—a quality of inestimable value for any laboratory worker.

We vaccinate our students against typhoid fever, primarily as a precautionary measure against accidental laboratory infections. However, this procedure also serves several other very useful purposes, for it gives the student personal experience with one immunization procedure, and he more readily appreciates many of the fundamental immunological and serological principles which typhoid vaccination may be used to illustrate. Since typhoid fever is by no means extinct in this section of the country, vaccination also gives the student protection against possible contact with polluted water or milk and carriers in his daily life. Vaccination is given strictly on a voluntary basis, but when the above advantages are presented to the students, practically all avail themselves of the opportunity.

It is thus the writer's contention that only by handling pathogenic organisms himself can the pharmacy student avert a possible bacteriophobia and have complete confidence in his own laboratory technique so that he can walk into a public health or hospital laboratory on an equal basis with his competitors who have had this training in other types of institutions.

RECENT BACTERIOLOGICAL MEDIA AND SEROLOGICAL METHODS

It is not enough that the pharmacy student should learn something of the basic bacteriological procedures, media and stains used since the time of Koch and Pasteur. If he is to be well equipped, he must know the composition and use of some of the newer bacteriological media, and be familiar with the appearance of pathogenic organisms on these media which are now being used in the better health department and hospital laboratories.

The following is a partial list of some of the newer media which are rapidly replacing or supplementing such classical media as Endo's agar, eosin-methylene blue agar, Loeffler's medium, etc. In the diagnosis of diphtheria the use of blood or serum agar containing potassium tellurite is becoming very

popular, because of the comparative ease and rapidity with which *Corynebacterium diphtheriæ* may be isolated and identified in nose and throat cultures. The use of bismuth-sulphite agar, devised by Wilson and Blair, for the isolation and identification of *Eberthella typhi,* is to be regarded as one of the major advances in the diagnosis of typhoid fever. Not only does this medium afford a more rapid method of isolating the organisms from feces and urine, but also a higher percentage of isolations is obtained than with the older Endo's and eosin-methylene blue agar. Leifson's Selenite F medium for primary enrichment and desoxycholate-citrate agar for the isolation of *Eberthella typhi* are probably equally as good as Wilson and Blair's medium.

After many years' experimentation with media for the isolation of *Mycobacterium tuberculosis,* one has finally been evolved which appears to be highly successful. Those who have used Petragnani's medium for the isolation of the tubercle bacillus from sputum, claim that it is equally if not more reliable than guinea pig inoculations. All comparative tests with other types of media indicate that it is just as good if not better than the best media previously devised for this purpose.

The student should also become familiar with the use of some of the newer media for the examination of milk and water, such as Dominick and Lauter's medium, Nobel's medium, brilliant-green-lactose-bile, etc. We use practically all of the above mentioned media in our bacteriology course with comparatively slight increase in expense and time required for preparation.

We should like to note in passing that one of the most valuable exercises in our bacteriology course is the examination of "unknowns". That is, toward the end of the course we hand each student a broth culture containing four different organisms such as *Eberthella typhi, Corynebacterium diphtheriæ, Streptococcus hemolyticus, Brucella abortus,* etc. We prepare a series of such combinations from some fourteen organisms so that not more than three or four students in the class have the same combination. A definite amount of the various types of media is given to each student and he is required to isolate and identify each of the four organisms with the allotted media within three laboratory periods. This exercise tests the student's skill in isolating pure cultures and re-

quires him to proceed by logical steps toward the identification of each organism with a minimum of media and time. The intense interest that this exercise creates among the students is indicated by the unprecendented stillness which falls over the laboratory while they are working on their unknowns. Those students who succeed in identifying all of the organisms, and the majority do, experience a justifiably profound sense of satisfaction and accomplishment.

Many advances have been made in recent years in the serological tests used in diagnostic laboratories, and we believe that pharmacy students should learn how to conduct the more important of these newer tests.

The old Widal test for typhoid fever has become more complicated but of increased value by the use of the so-called H and O antigens. The student should learn how to prepare these antigens and carry out the test with the two antigens. In addition, he should be instructed in the interpretation of the results so that he may present an intelligent explanation to the clinician who is usually not familiar with the recent advances in serology.

The Wassermann test is rapidly being replaced or supplemented by various precipitin tests such as the Kahn, Kline, Hinton, Eagle, etc., tests for syphilis. We teach our students to carry out the Kline exclusion and Kahn diagnostic tests as well as the Kolmer Wassermann test. Even though the Wassermann test may eventually be discarded by most diagnostic laboratories it should be taught for the purpose of demonstrating the principle of complement fixation.

The rapid plate agglutination test, originally devised by Huddleson for the diagnosis of Bang's disease in cattle and recently adapted by Welch and Stuart for the diagnosis of enteric fevers in man, promises to replace the macroscopic tube agglutination tests, and we are, therefore, teaching our students to perform this test.

Until a few years ago the typing of pneumococci by the existing methods in the class laboratory was impractical because of limited time. However, with the advent of the rediscovered Neufeld method, which is so rapid and successful that it has almost entirely replaced all other methods of typing, the typing of pneumococci in sputum makes an excellent laboratory exercise which is so important that we require our students to carry out this simple procedure with considerable accuracy.

Finally, we believe that the laboratory work for pharmacy students should also include some exercises not usually undertaken in medical or dental courses. We teach our students to test the germicidal properties of ointments; the sterility of drugs in glass ampules; and the comparative value of various concentrations of such drug preservatives as sucrose, alcohol, sodium benzoate and glycerol. Pharmacy students especially should carry out one of the standard phenol coefficient tests and, in addition, should thoroughly appreciate the uses and abuses of this test.

The writer has attempted to outline briefly some of the recent advances in bacteriological and serological technique, which, in his opinion at least, are essential for the pharmacy student to learn by actual practice so that he may be adequately trained for positions in public health, hospital or research laboratories.

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Manufacture of Patent or Proprietary Medicines[1]

M. L. SCHREFF

Department of Pharmaceutics, Benares Hindu University, Benares

India is at present flooded with all kinds of so-called patent medicines. Many indigenous and foreign manufacturers aim at marketing only such medicines as will bring them more money in business, regardless of the ethical value of such practices. It is important for us first to see what is meant by proprietary medicines and secondly to study how the Indian public is being exploited by the foreign as well as the indigenous manufacturers by the distribution of these patent or proprietary medicines and to suggest remedies for the same.

The meaning of the terms "proprietary and patent medicines" is very confusing and even the pharmacy acts in various countries make matters worse confounded. There is a lot of agitation going on in U. S. A. at present to limit the use of these terms. Before the advent of large manufacturing concerns, the terms "patent and proprietary medicines" were

[1]Reprinted by permission from "Science and Culture", Vol. 3, No. 11, May, 1938.

synonymous, and they implied medicines manufactured for self-medication in the absence of medical advice. At present, they represent many such medicines as have been evolved by the research departments of manufacturing concerns and embody among them ingredients some of which are very potent and poisonous. Accordingly, these are not at all suitable for self-medication and have no similarity to the so-called patent medicines. These products, instead of being advertised for direct medication to the laymen, are only advertised for the use of the medical profession, *e.g.*, "Plasmoquine compound," "Betaxin," etc.

The pharmacy laws in some of the advanced countries, as well, have fallen behind times. In one of the states of the United States of America, the term "proprietary medicine" is defined by the Pharmacy Act thus: "Proprietary remedies, when not otherwise limited, mean remedies that a certain individual, or individuals, have exclusive right to manufacture or sell." Such definitions as these are very dangerous and help unscrupulous manufacturers to sell unstandard things under the name of proprietary remedies. Recently the Crescent Bottling Works, U. S. A., manufactured a solution of Citrate of Magnesia under the name of "Duke's Magnesia citrotartrate" as a proprietary remedy, the difference between the official preparation and the proprietary remedy being that the latter was slightly adulterated and was understrength. Of course, the law courts prosecuted the firm for this evasion of the state laws but such things as the one mentioned here are going on in India unabated. The same conditions exist with aspirin compounds where aspirin, a purely chemical compound, is mixed with a little acetanilide, or phenacetin, or caffeine, etc., and given fancy names and sold as a proprietary remedy.

There are many other cases where medicines which are practically simple mixtures of official substances are sold as proprietary remedies. The formula, for instance, of "Kapseals Ventriculin with Iron and Vitamin B" is given as follows: Ventriculin 5 grains; this is the proprietary name for stomach, now official in the U. S. P.; (2) Naferon, 2 grains; this is iron and ammonium citrate neutral; and (3) vitamin B_1 and vitamin B_2. Again, a firm is marketing a chemical compound, ammonium mandelate, under the fancy name Mandamon. It will thus appear that a great many

proprietary remedies of today are simply prescription products but are sold as proprietaries, which helps them to get more money from the public. Instead of prescribing the proprietary medicines, it would be far better if the medical men wrote prescriptions and the Indian manufacturers manufactured galenicals and other products like yeast extract, stomach (U. S. P.), ammonium mandelate, phenobarbitone, etc., because such procedure would save a lot of money to the customers, who in a great many cases are asked to pay fancy prices for adulterated drugs, bottled in fancy bottles, and packed in cartons with attractive printing, in the name of proprietary remedies, the ingredients of many of which are unknown even to the prescribers.

Let us take a few more examples of the composition of proprietary remedies and compare them with official remedies which can be prepared and sold at a very cheap rate. Sprays and inhalants containing about one per cent chlorobutol, ephedrine, camphor or menthol, thymol, oil of cinnamon, etc., dissolved in liquid paraffin are sold under proprietary names and charged huge prices whereas the same can be dispensed in any dispensing shop at less than half the cost. Further, the same preparations, if sold under names given in official books of various countries, can be obtained at a much cheaper rate than when purchased as proprietary and patent remedies. There are a large number of so-called proprietary preparations in the market containing glycerophosphates of calcium, potassium, sodium, magnesium iron, manganese, strychnine, etc., with a little coloring matter, syrup, glycerine, and alcohol. Such preparations can be dispensed very cheaply and easily or may be supplied by any of the manufacturing houses at half the cost under official names as compared with the prices paid for similar preparations under fanciful names. The formulæ of syrups and elixirs of glycerophosphates are given in many books, *viz.*, the Australian and New Zealand Pharmaceutical Formulary (A. P. F.), British Pharmaceutical Codex (B. P. C.), National Formulary (N. F.), etc., and if one were to compare the constituents of these formulæ with those of the proprietary ones, it will become evident that the official preparations and proprietary preparations are very much alike, and in many cases, the official ones are much superior to the patent ones. Further, the official preparations can be combined with a little yeast extract, and nucleic acid

or lecithin, etc., to add other properties, and thus replace completely the foreign and indigenous proprietary remedies, many of which are worthless.

It would seem desirable that medical men do not prescribe patent or proprietary medicines, unless they be truly proprietary and could not be prepared on the counter, *e.g.*, Abidol (A, B, D, Vitamins), pure synthetic organic compounds, various glandular products, etc., because by writing their own prescriptions, the members of the medical profession will be helping the real pharmaceutical industry by giving impetus to manufacturers to prepare basic pharmaceutical compounds instead of marketing simple concoctions. Further, many of the so-called indigenous proprietary remedies are simply admixtures which can be done easily in a dispensing shop but are done on a large scale by manufacturers and sold at exorbitant rates.

What are the implications of this question? This question of discontinuance of prescribing proprietary remedies will demand on the one hand a greater practice in the art of writing prescriptions from the practising physicians and on the other hand, the training of pharmacists will have to be improved. Further, the opening of new pharmacies shall have to be controlled by the Provincial Boards of Pharmacy, which must be satisfied regarding the qualifications of the manager and the dispensing chemist before permission is granted to any person or persons to start a pharmacy. Over and above this, the provincial Governments shall have to immediately take up the question of instituting proper courses for training pharmacists and dispensing chemists. A friendly coordination between a well-trained pharmacist and a medical man can help the development of pharmaceutical industry on sound lines. The Government has also to make laws prohibiting advertisements appealing to the public to buy medicaments for self-medication. If these suggestions be implemented, the pharmaceutical industry in India will make rapid progress on sound lines. The manufacturers will then take up the manufacture of various synthetic drugs, vitamins, hormones, enzymes, etc., and their energy will not be dissipated in manufacturing mixtures and concoctions.

A Laboratory Technician Course for Pharmacists[1]

DAVID B. R. JOHNSON
School of Pharmacy, University of Oklahoma

A paper dealing with this subject may draw unfavorable criticism from certain sources since there is at the present time a controversy between the American Medical Association and the American Chemical Society over the control and operation of clinical laboratories. We do not need to go into the pros and cons of this controversy, as what I have in mind is not the training of druggists to become hospital technicians, but to give certain courses in microscopical physiological and chemical technique that will enable the druggist to be helpful to the physician in villages and rural districts who do not have access to a well equipped clinical laboratory or a hospital with a well established technician service.

For many years the family doctor has been passing out of the rural districts of Oklahoma. Clinics in the larger centers have been drawing all the patients that have money to pay for medical services, thus leaving the small town doctor to starve or go to the larger towns where there are hospitals. There is more need today for the well trained family physician to keep the rural neighborhood in health than ever before. The community is also made up of a more enlightened group of people and one that is more responsive to health needs and to instruction. More than ever before the local doctor is a local need. There is no community so small that it does not need the services of a doctor to detect disease and prevent epidemics and to see to it that the necessary sanitary measures are taken to safeguard the health of the community. Nurses can be hired, or taken to a home, or to temporary hospital quarters where they can be provided. The only basic thing in the town, that cannot be imported, is the technician. If the local physician could have the services of a skilled technician, he would be enabled to give, in many cases, as adequate a service as the hospital offers with the added advantage to the patient and the mental satisfaction of being at home under the friendly home doctor. There is not enough work in the small town to support a full time technician. In fact in Norman, Oklahoma, a city of 10,000 people, the doctors

have several times joined in an effort to support a technician and failed.

The pharmacy student has the very finest basic training in chemistry, bacteriology, physiology and pharmacology to give him a good background training in medical technology. As a matter of fact in these courses he comes in contact with the fundamental methods that lie at the bottom of the technician courses. What he needs in these courses is a sufficient amount of training to give him skill so that his work becomes reliable. At Oklahoma we have for six years been giving technician courses and are now in a position to see the results of such training in the service which the graduates are giving. Not only does such training help the druggist to be helpful to the doctor, it also helps him to have a better understanding of his pharmaceutical problems in his relationship to his patrons as well as his doctor. For those who become hospital pharmacists in hospitals where there is an independent technician service, it gives them a more intelligent and sympathetic understanding of the other departments of the hospital. To those who go into manufacturing or sales work it enables them to discuss problems more intelligently than if they had not had such training. In other words, the technician courses are an asset to the pharmacist's training, irrespective of the type of work he enters and looked at from the viewpoint of giving him greater satisfaction because of his own intellectual attainment, they are very much worthwhile.

To Dr. Robert Swain we bare our heads when he at the beginning of his career as editor of Drug Topics declares,

"It is my belief that pharmacy needs to strengthen its professional morale, to manifest greater interest in civic affairs, to cultivate a professional pride and self-respect, and to adequately understand the purposes and objectives of pharmacy in the public health scheme of today. We need to vitalize our professional attitude, and learn that any calling is great which is greatly pursued. At any rate, I enter upon my new duties with sincere belief in the essential characteristics of professional pharmacy, with an unquestioned conviction that it serves as an essential public service, and that as we raise the professional equation of pharmacists themselves we raise the status of the profession itself. To these objectives, I solemnly pledge my every effort and ability."

And may I say Dr. Swain, in behalf of the American Association of Colleges of Pharmacy, that we believe in you and that your declaration shall be our declaration and your pledge shall be our pledge.

Rufus A. Lyman.

EDITORIALS

College Loyalties

Unless we meet up with an occasional red light, who can tell how many bearings would burn out? The temptation is to run too fast, too far and too long.

Before the red turns green suppose we reflect on the high spots of the journey and their meaning. They tell us we are all salesmen, and whether it is goods over the counter, or making love to the only other one in the world, and even the matter of religion, there are those who put a cash register atmosphere to it all.

On this basis let me buy your education. You do the selling and name your price. Of course, this belongs to the funny column. Men have been known to sell their bodies and even their brains (after death) but they do not sell their brains and make delivery.

Our educational system, the pride of our country, is rightfully credited with much of the enviable success of the United States. But where is the man, rich or poor, who adequately paid for value received in his college course!

The University Grants Committee of Great Britain reporting on 50 universities shows that 36 per cent of the cost is covered by parliamentary grants, 8.5 per cent by local grants and only 31 per cent by tuition and examination fees with 14.8 per cent from endowments and 2.4 per cent on donations and subscriptions.

There is no reason to believe the figures are much different in this country except where the college is independent, and then the burden is more definitely on the Board of Directors with the same advantage and the same obligation on the student.

We would not sell our education; first, because no cost system yet evolved can estimate its accurate values, and second, simply because we are not "on the market". We may (and do) sell the fruit of our brains but that is different.

So we have a priceless commodity and the more we think before the light turns green, the more we are compelled to acknowledge the values of our college heritage.

College loyalties mean more than rooting at the big game. They mean much more than "giving them a hand" at commencement.

All honor to the graduates who, without promptings, have sensed and acted on their obligations by donating time, thought and money to making it easier for the Board to help other young students.

Our thought is to go a little further and bring to your attention the idea that a substantial donation NOW or as a legacy would be one real evidence of alma mater loyalty. It would encourage the board in a warmth of real meaning to the matter of college loyalties. It would help other students and finally do much to perpetuate your name after you have passed to the other side.

Other methods may suggest themselves to you but where is the college having the last word in equipment? A legacy without specified method of use would be splendid to satisfy an old bill or a mortgage and prove just as good as any kind of money; but a laboratory, a library, a class room, a group of chemical glassware, or biologic and other laboratory or teaching equipment would gladden the heart of every faculty member and ease his burden while increasing the teaching quality.

Too many of our big people in pharmacy and chemistry have helped in these ways in avenues not directly connected with pharmacy. Well and good, but our plea is for pharmacy as fundamental to our continued successes and affording a better opportunity to render service.

You recall the ambition of one Abu Ben Adhem: "Write me as one who loved his fellow men".

Red Cross and other charities to Spain and China, flood areas and in epidemics, are mentioned only to approve and compliment the donors. These however are distant and usually spectacular. Their appeal is to the masses. Meanwhile if pharmacists and one time pharmacists overlook pharmacy who will support this noble profession?

To warrant endowments we are told to deserve them. Those who know are agreed that pharmacy has qualified. It remains for pharmacy to support pharmacy while informing the philanthropic public as to just what we are doing for the community in ways not attempted or even possible to industry or the other professions.

Frank B. Kirby,
The Abbott Laboratories.

Pharmacy and The State

New Jersey is looked upon as a progressive state in matters pharmaceutical. It has well-equipped pharmacies, good pharmacists, an efficient Board of Pharmacy and an excellent teaching institution devoted to the training of future pharmacists. The people of New Jersey expect all who are concerned with the production and distribution of drugs and medicines to play their part efficiently and effectively so that the public health may be conserved and improved. We suspect that if a popular vote were taken, the people would register approval of any reasonable method of maintaining adequate control of drugs and medicines from crude materials to finished products and proper education of personnel having to do with the manufacture and distribution of drugs from unskilled laborer to master pharmacist. Consequently, the public would expect an equitable share of its tax dollar to be allocated to the purchase of the protection which it expects in this field.

The fact is, of course, that the State makes no direct contribution today toward pharmaceutical education or pharmacy law enforcement. The pharmacists of New Jersey and those who expect to become pharmacists contribute the taxes which finance enforcement of the pharmacy law. Pharmacy students finance their professional education to a large extent. The deficit is made up by drawing upon such other income as the New Jersey College of Pharmacy may have and the general resources of Rutgers University, of which the College of Pharmacy is a part.

The higher educational requirements which have become effective in recent years have not only increased the expense of instruction in pharmacy but they have lowered the income of the college from student fees because there are fewer students. A critical situation, therefore, confronts the college.

The Board of Regents of the State of New Jersey, whose function it is to determine the State's needs for higher education and recommend appropriations for such education to the legislature has studied this situation and found it in the public interest to recommend an appropriation of $25,000 for the use of the College of Pharmacy. This sum would go far toward providing and maintaining necessary equipment and personnel which will assure continued top-rating for the College among the pharmacy schools of the country.

The State is confronted with a difficult financial situation this year and the tendency of the legislature is not to sanction new expenditures. Accordingly, the appropriation recommended by the Board of Regents for the College of Pharmacy may encounter rough sledding. However, we are concerned with the principle involved and we believe that sooner or later this principle will have the endorsement of the legislature. The principle is that professional education for New Jersey citizens must have support from the State.

New Jersey men and women who are capable of studying medicine or dentistry have no place to go in New Jersey to obtain an education to fit them for these professions. They are a burden upon other states because they take places in the medical and dental colleges of other states which might otherwise be available to capable and deserving students of those states, and the taxpayers of those states thus contribute to the education of physicians and dentists for New Jersey.

Pharmacy is the only profession in the health group which has provided educational facilities for its prospective members. The New Jersey College of Pharmacy was organized in 1891 as a non-profit institution. It became a part of Rutgers University in 1927. Had it not effected this union, the College of Pharmacy could not have met the new educational requirements without a heavy endowment or state aid. The pharmacists of New Jersey are already financing pharmacy regulation and law enforcement, thus relieving the State Treasury of an expenditure of more than $20,000 annually. It would be very difficult and unreasonable to expect them to also finance a College of Pharmacy. Endowment funds from industry and public-spirited citizens are no longer forthcoming because of the changing attitude toward private benefactions. Therefore, if the New Jersey College of Pharmacy were not a part of Rutgers University, we would long ago have been at the door of the legislature asking for a substantial annual contribution from the State toward maintaining an adequate educational program for pharmacy. The State would have had to decide several years ago whether it would assume its obligation in this field or tell us to send our boys and girls to neighboring states and sponge on their citizens for an adequate pharmaceutical education, as is done with medical and dental students today.

It is inconceivable that the state would have allowed the

College of Pharmacy to close its doors. The union with Rutgers postponed the date of requiring aid from the State, but the fundamental question is still unanswered and it will have to be answered in the near future. No other department of the University should have to give up needed support to accommodate the College of Pharmacy. The request of the Regents is for a separate and distinct appropriation for Pharmacy and it should be treated as such by the legislature. The pharmacists of New Jersey have a duty to perform in this connection. It is to let their senators and assemblymen know that pharmaceutical education needs state support, but that such support is not desired at the expense of any other unit within Rutgers University, or the activities of the University as a whole. It is desired purely on its merits.—Robert P. Fischelis, *New Jersey Journal of Pharmacy*, February, 1939.

Where Are We Going?

The greatest need of American pharmacy today is a common objective. We have a number of pharmaceutical organizations, possibly too many, and while each may have an objective different from that of any other organization, should not the trend of all be in the same direction and toward one large primary objective? Cooperation between all constituent groups of the pharmaceutical family would lead to the solution of many of the present day problems of pharmacy. A common objective would undoubtedly help to bring about such unity of effort. All groups may have a function and serve a purpose but their functions and purposes should coordinate toward a definite end. Membership in pharmaceutical organizations is not as large as it should be. Would a knowledge of definite objectives and policies serve to stimulate and increase membership? If objectives and policies were continuous until the ultimate of accomplishment and if definite progress and trends could be consistently demonstrated, would not opinion, effort and cooperation become crystallized toward a common end?

How can it be determined what the ultimate objective of American pharmacy is or should be? Who is to determine the ultimate objective? If and when an ultimate objective has been found, how is it to be attained? Who is to formulate the programs leading toward that end?

The two most important factors which will decide these issues are *need* and *education*. When American pharmacy reaches the point where it is compelled to really fight for existence, then there will be cooperation between its constituent branches. During the past ten years there has been some necessity for pharmacy to fortify its position and defend this position and as a result there has been definite progress in the direction of unity and cooperation among the members of the pharmaceutical family. Pharmacy has not yet suffered to the extent that selfish and group interests are subordinated in favor of fundamental principles effecting American pharmacy as an autonomous unit. Each group still takes the attitude that the particular interests of that group are most important and should, therefore, predominate. Pharmacy has not yet been compelled to endure the pangs of starvation and hence individuals in the various groups still maintain that individual interests are of primary importance and hence should receive major consideration.

American pharmacy is prone to look to legislative bodies to solve its problems by enactment of laws reserving certain rights and privileges to pharmacists and denying them to others. This attitude seems to be justifiable as long as such reservations and prohibitions are conducive to the best interests of the general public. Consequently, would it not be right and proper that pharmacy should at the same time include in legislative acts provisions which would raise the standards of pharmaceutical service within the profession. Such an attitude would indicate a degree of sincerity and honesty of purpose which would greatly enhance the confidence of the general public in the profession of pharmacy.

United effort and cooperation can be brought about through understanding. The members of the profession must be informed concerning the fundamental issues and objectives of pharmacy. To accomplish this someone must assume the initiative. Who should or will accept this responsibility? Obviously, here is not only an obligation but an opportunity which the schools and colleges of pharmacy should willingly and eagerly accept. Such programs may be carried out through conferences, short courses, adult vocational courses, city, county and district pharmaceutical organizations, state and national associations. Several colleges have already started such programs and in some instances at least a new spirit of professionalism is apparent and growing. The ultimate aim

should be to reach every member of the profession and enlist him in the campaign for an improved pharmaceutical service.

After all, the real hope for the future lies in the succeeding generations. Hence, every effort should be made to imbue the young men and women in the colleges with a spirit of unity and cooperation and to educate them to the value and importance of united and concentrated effort toward definite ends. This was the purpose of the plan adopted by the American Pharmaceutical Association for the organization of student branches in the schools and colleges. How much of this spirit has been caught by the schools and colleges?

B. V. Christensen.

Food, Drug, and Cosmetic Legislation

That the public is already beginning to have better protection against the indiscriminate advertising and sale of unsafe drugs is evident by the recent restraining order issued against the manufacturers of a widely used headache preparation. In its place, probably a good product, yet under the directions for use it might do great damage. "A heaping teaspoonful, etc." is, in the average home, subject to wide variation, in instances probably almost plus 100 per cent. Many studies on the teaspoonful have shown that in administering drugs which might be regarded as somewhat dangerous in average doses, language of this kind is unpardonable.

While we regret that so well known and reputable a firm has got into trouble, we feel that the example of a large company being one of the first to be called under the new law is evidence that those responsible for its enforcement are going to play no favorites.

Now that the colleges of pharmacy have their students for four years of training, they have a heavy responsibility for acquainting their students with public health matters as they are involved in food, drug, and cosmetic laws. Good pharmacy in the future, in all that the term implies, is now in the hands of the colleges of pharmacy more than ever before.

Our students should be made to feel that they are responsible guardians of public welfare in a very large way. The responsibility is upon our shoulders now.

Wortley F. Rudd.

A Way to Foster Idealism

Many writers have attempted to predict the future of pharmacy. Many more will continue to do so in the future. And all who thus join the fraternity of "seers" will have done little more than attach their names to the bibliography on the subject unless they offer something substantial in the matter of a positive force either to neutralize their dire forecasts or to insure their optimism, depending on which school of thought they support. There are basically only two schools concerning the trend of future pharmacy. One made up largely of that class of retailers and handlers of drug products who look upon pharmacy as a business and the other is made up of the professionally minded retailers, the hospital pharmacists the high type of pharmaceutical manufacturers, the research workers and the pharmaceutical educators who look upon pharmacy as a public service profession. It is this attitude held by this second class that should be publicized and the work logically belongs to the faculties of the colleges of pharmacy. Temperamentally and environmentally they are ordained to be the foci of such propaganda. In the past they have constituted the membership of the optimistic school of predictors. Carrying on involves no new traditions but it does require a new approach. It is not enough to write an article now and then telling of the promised land to be formed by a schism in the retail ranks, and to mention that hope now and then in class. Such effort has only the effect of an occasional rain in the drouth area. It is not even good pump-priming of professional enthusiasm.

Instead, every faculty member must participate in a steady campaign designed to create in the minds of the students a vision of what can be done if everybody pulls in the same direction at the same time. This campaign must be so devised and carried on that to even the most obtuse collegian it is clearly practical. It must have the extra virtue of proclaiming quite frankly that the student must carry it to the employer. To that extent it is a youth movement.

Each faculty might well have one man, preferably the head of the college, whose principal responsibility it would be to originate and administer the flow of material used. He should be considered as supervising a course designed solely to increase the spiritual caliber of the profession. Vision,

zeal, the will to do, appreciation of opportunity need cultivation and direction every bit as much as the manual skills. He should be charged with creating through the active cooperation of the entire staff the spirit of pharmacy in the students, opening their eyes to the possibilities in the profession, directing their attention to feasible ways of realizing the opportunities, and firing zeal for and pride in the profession that will burn over and through the opposition and pessimism of all the defeatists.

History demonstrates so clearly how the small become large, the downtrodden become great, the suppressed become articulate and flower to the full of their rightful capabilities, all because they at last really decided that they would. The historical converse is also true. Those who have lost the aura of prestige and station and succumb to disgrace, wither and vanish.

The colleges of pharmacy have a responsibility and an opportunity. They can advance the profession or retard its progress as they will.

L. Wait Rising.

Whose Job Is It?

It is recognized that the progress made in pharmaceutical education during the past twenty years has been remarkable. Those responsible for the advancement are to be congratulated. It is further recognized that the work is not finished. Paralleling further educational advancement, working conditions in retail pharmacy should be improved. This thought is not original with me, but is brought up here as the result of observations made at the recent meeting of the American Association of Colleges of Pharmacy at Minneapolis.

As a newcomer in the field of pharmaceutical teaching I do not know what is involved in the solving of this problem, but I should like to see it attacked at once. If it is not the function of the Association, whose job is it? The colleges demand high educational requirements, why should not the conditions for them to work under be improved? Much was said about making even higher educational requirements and about getting a finer quality of student in our schools. If working conditions could be improved in retail pharmacy, undoubted-

ly a better class of students would be attracted to the study of pharmacy. The bringing of a higher type of student into pharmacy would tend eventually to improve working conditions in pharmacy, but this would be a slow process. Perhaps the improvement of these conditions could be hastened if the American Association of Colleges of Pharmacy, the National Association of Boards of Pharmacy, the American Pharmaceutical Association and the National Association of Retail Druggists should pool their efforts in working out a plan to improve the working conditions in retail pharmacy. I should like to see this tried.

Thomas D. Rowe.

The Pharmaceutical Curriculum

At the spring meeting of District Number 5 at Sioux Falls, South Dakota, the boards and colleges expressed their feelings concerning curriculum building forcibly in a resolution which reads as follows,—It is the sense of this group, that in the construction of the next edition of the Syllabus, that minimal basic requirements be fixed along the traditional lines which have been laid down by teaching institutions that give a four year course and that the remainder of the curricular requirements be left so that individual instruction can develop their own curricula to meet the anticipated needs of their students and that all courses both required and optional be definitely of college grade." The resolution infers that too great regimentation is not desirable, that an institution should be allowed to develop its courses so that its product may be recognized because of a certain type of training and so students may be better qualified to enter special lines of pharmaceutical work. But whatever the courses given, they should be of standard college grade which means, that courses of grade or high school caliber should not be evaluated on the college level.

(Other problems discussed were,—1. The certification of experience. 2. A uniform change in the practical examination. 3. The restriction to official preparations of medicines used in the care of relief clients. 4. The support of pharmaceutical education and research by druggists and manufacturers. 5. That applicants for licensure be free from communicable diseases and habit producing drugs.)

Rufus A. Lyman.

THE EDITOR'S PAGE

For two months the Editor was stranded in the Slough of Despond. He had been led (perhaps with malicious intent) to believe that everybody reads the Editor's Page. Banking on this he took, in the January Journal, a page and a half to call attention to what he considers one of the most important questions of the day, namely—the danger of too much uniformity and regimentation in curriculum building. He compared the idea as being on the same plane as the enforcement of the use of a uniform pencil sharpener in all colleges. He thought by spending three hundred and forty-two cents in this way he would arouse some discussion that would be of value to the Syllabus Committee. Not a word came from any individual on the pedagogical side of the fence. A brother editor who is also a state board member, however, did come to his aid. I shall not give his name, although I do not believe he would object if I did. He wrote under date of February second,—"The January number of the American Journal of Pharmaceutical Education arrived today and I turned at once to the Editor's Page. One could speculate at length upon the advantage to be derived from an application of the suggestion of the Editor. However, anyone who has ever sent out a series of letters to pharmacy deans and others prominent in the profession, in the hope of obtaining a cross section of opinion promptly, realizes that the idea of a Uniform Pencil Sharpener is entirely too advanced. Apparently, there is an absence of pencil sharpeners of any kind in executive offices. Why not start the ball rolling by offering a used razor blade with every subscription to the Journal, to all deans and faculty members who have not yet subscribed to the Journal, thus assuring some kind of accessory pencil sharpening equipment, and later appoint your Committee on Uniformity of such Equipment." This the Editor has in mind to do. One fact stands in the way and that is where to get a supply of razor blades. It seems that some time ago Dean Ziefle of Oregon needed some used razor blades and sent out an emergency call to the druggists. He got them by the bushel basket; that supply is gone. I shall take the matter up with the Pullman Company. If a supply is not forth-coming from that source, then the following sug-

gestion is made. Hereafter, whenever you see a safety razor blade, or an old fashioned razor, or an electric razor, or a barber shop, stop and ask yourself two questions: (1) Have I contributed anything to curriculum building? (2) Have I subscribed for the American Journal of Pharmaceutical Education?

There is no more important problem today, facing the whole field of education (grade, high school, college, graduate and professional,) than curriculum building. Recently an outstanding state university president made the statement that the most important step for any profession to take was to make its curriculum respectable. This is something for us to bear in mind as we construct the new syllabus. When the Syllabus Committee and the American Council on Pharmaceutical Education present us with a new syllabus I am wondering if we will be humiliated by seeing some grade school courses like so-called pharmaceutical arithmetic and so-called pharmaceutical Latin brought up to the college level. I believe in arithmetic. It has to be used by the student of pharmacy in practically every course every day of the year and the same is true of the practitioner of pharmacy. The same may be said of the multiplication table, but that is no reason for making the multiplication table a required course in the pharmaceutical curriculum. While we are at it, let us have a dignified respectable curriculum on the college level.

In this issue appears the report of the Committee on Accrediting Agencies of the Association of State Universities and Land Grant Colleges. The report is submitted by the committee chairman, President John J. Tigert of the University of Florida. The report calls attention to some of the dangers which may result from the domination of universities, colleges and even departments by accrediting agencies which too frequently take upon themselves the methods of some labor unions. In this connection, it would be well to read University Control of Professional Education by Dean C. B. Lipman of the University of California on page 367 of volume one of this journal. If academic freedom

of thought and action is to be maintained, the fixing of the curriculum must be left in the control of the teaching institutions. The accrediting institution is needed for standardization. In pharmacy we are in an enviable position since the curriculum building agency and the accrediting agency are cooperating toward a common objective. It will be noted that a list of accrediting agencies is attached to the report referred to. It includes two pharmaceutical accrediting agencies, the American Council on Pharmaceutical Education and the American Association of Colleges of Pharmacy. The Editor has called the chairman's attention to the fact that the Association should be removed from the list, since with the creation of the Council, the Association ceased to be an accrediting agency.

In the Editorial section is reprinted an editorial entitled Pharmacy and the State taken from the New Jersey Journal of Pharmacy. While Dr. Robert P. Fischelis wrote the article because of a local situation in New Jersey, it is pertinent to every state in the Union. Frequently the statement is made that there are too many colleges of pharmacy and that is true in many states. But there are states where there is no college of pharmacy and several where there are no professional schools that have to do with public health. A sovereign state loses something that detracts from its dignity when it does not provide a complete educational system of its own, or if this is impossible, does not contribute financially to the education of its professional men in the professional schools of some other state. A public health consciousness and if we want to limit it to the field of pharmacy, a pharmaceutical consciousness will never be attained until the citizens of a state provide institutions or funds for the education of its pharmacists.

Every cloud has a silver lining. The cloud this quarter was the indifference of the Editor's colleagues to the menace of the uniform pencil sharpener idea applied to curriculum building. But the sun rose and the silver lining appeared and it grew and grew until it enveloped the cloud and nothing but the silver sheen remains. Here is how it happened. By

some chance there came to the Editor's desk a program of the award of certificates of registration to registered pharmacists by the Board of Pharmacy of the State of New Jersey. A program in which the officers of the Board, President Robert C. Clothier of Rutgers University and Governor A. Harry Moore took part. That program certainly could not fail to impress upon the new licentiates in pharmacy the importance of their responsibilities to the state. The effort necessary for the staging of such a program is more than compensated for by the dignity it brings to the practice of pharmacy. Then the rank and file of New Jersey druggists contributed their part to the cloud's silver lining in a very special way when they sent the Editor this resolution—"Resolved, That the New Jersey Pharmaceutical Association in Convention Assembled this 25th day of January, 1939, petition the legislature of the State of New Jersey to include in the annual appropriation bill an allotment for pharmaceutical education in the Rutgers University budget, which will be as adequate as possible, under the financial circumstances of the State, to meet the needs of the College of Pharmacy in providing the services so necessary to continue the high character of teaching and research which are essential to the proper education of pharmacists." Conditions may be such this year that this request for the College of Pharmacy may not be fulfilled. A year or two or three makes little difference. The point is, that when the retail druggists of a state manifest the interest and the determination that these New Jersey druggists do, pharmaceutical education will be cared for in that state in the due process of time. But the New Jersey druggists are not alone in their support of pharmaceutical education. A casual glance through the Gleanings from the Editor's Mail in the last two numbers of this journal, is all that is necessary to show that the same attitude is held and the same thought is running through the minds of the board members who represent a wholesome cross section of the rank and file of the druggists in this nation.

Since the beginning of the publication of this journal, nothing has been written that deserves more careful reading and thoughtful meditation than the editorial in this issue

entitled "College Loyalties" and a letter by Dr. Frank B. Kirby of the Abbott Laboratories, and a letter from Dr. E. L. Newcomb, Executive Vice-President of the National Association of Wholesale Druggists. They point the way, with great clearness, that must be taken if pharmaceutical education and pharmaceutical institutions are to share in the wealth which pharmacy creates. We are grateful to them for their sympathetic understanding and assurance of support. The days for criticism have past. The days for cooperation are at hand. Lacking in intelligence, indeed, must that one be who sees only in the pharmaceutical horizon a black cloud. To the thoughtful man who thinks this thing through along the line indicated in these letters, the cloud not only acquires a silver lining, it becomes a silver plume.

Rufus A. Lyman.

NEW SUBSCRIBERS TO THE AMERICAN JOURNAL OF PHARMACEUTICAL EDUCATION SINCE THE JANUARY 1939 ISSUE

Adams, A. Lee, Glencoe, Ill.; Albany College of Pharmacy, Albany, N. Y.

Bloome, Ralph J., Detroit, Mich.; Boberg, Edwin J., Eau Claire, Wisc.; Brady, Peter H., Spokane, Wash.; Brakke, N. N., McVille, N. D.; Brooklyn College of Pharmacy, Brooklyn, N. Y.; Buffalo, The University of, Buffalo, N. Y.; Butler, Guy, Lincoln, Neb.

Callaghan, Percy J., Manchester, N. H.; Canis, Otto F. A., Kew Gardens, N. Y.; Canis, Otto P. M., Newark, N. J.; Chapman, C. W., Baltimore, Md.; Cincinnati College of Pharmacy, Cincinnati, Ohio; Clark, Harold F., Kansas City, Mo.; Clark, Perry, Chillicothe, Mo.; Cook, Roy Bird, Charleston, W. Va.; Crombe, David H., Wickford, R. I.; Cutting, Joe, Williston, N. D.

DeFoe, O. K., St. Louis, Mo.; Duke Hospital Pharmacy, Durham, N. C.

Erickson, Mrs. Vincent R., Iowa City, Ia.

Faris, Dorothy D., Pocatello, Ida.; Feit, Victor E., St. Paul, Minn.; Ford, M. N., Columbus, Ohio.

Gauger, Charles H., Buffalo, N. Y.; Gibbs, E. W., Birmingham, Ala.; Goldstein, M. G., Washington, D. C.; Gramling, L. G., Washington, D. C.; Griess, Walter P., Cincinnati, Ohio.

Hanson, R. C., Streeter, N. D.; Hewitt, Harold G., Buffalo, N. Y.; Hopkins, Howard, Lincoln, Neb.; Hoskins, T. W., Louisville, Ky.

Jones, George R., Seattle, Wash.

Kansas City College of Pharmacy, Kansas City, Mo.; Kelly, John R., Newport, N. H.; Kirshmeyer, Fred J., St. Louis, Mo.

Larson, J. Elida, Iowa City, Ia.; Lynn, E. V., Boston, Mass.

McCabe, R. L., Detroit, Mich.; McDuffie, Roger A., Greensboro, N. C.

Mathews, A. W., Gainesville, Fla.; Menendez, Jose, Puerto Rico; Mondry, Frank W., St. Paul, Minn.; Moulton, George A., Petersborough, N. H.; Murray-Breese Associates, Inc., New York City, N. Y.

National Wholesale Druggists Association, New York City, N. Y.; Neimeth, Edward, Brooklyn, N. Y.

Park, Lloyd M., Madison, Wisc.; Plein, Elmer M., Seattle, Wash.

Raabe, Rudolph H., Ada, Ohio; Reamer, I. T., Durham, N. C.

(Continued on page 272)

GLEANINGS FROM THE EDITOR'S MAIL

Is there such a thing as an association of pharmaceutical publishers? It would appeal to me that the subject under discussion (support of pharmaceutical education) might advantageously be brought to their attention for concerted action.

Over in England I notice that the newspapers publish daily a list of legacies and other donations of a charitable and philanthropic nature. So far as I know, nothing like this is being done in this country and yet if it were a matter of daily report like the weather, it should have a favorable reflex influence, giving our publishers something to write about and the readers, something to read about. It would be interesting to see in concrete form, just what is being given to colleges, universities, hospitals and schools and by whom.

Such information might at least help stem the tide, which seems to be in reverse just now, as regards total donations of this character. Let me urge your style, as peculiarly effective on this subject and the hope that you will find a little time to write for publications other than the *American Journal of Pharmaceutical Education.*

FRANK B. KIRBY, Director of Education,
The Abbott Laboratories.

Thank you very much for your letter of February 18th. We agree completely with the thoughts you express, (That some of the wealth made in pharmaceutical activities should be used for the improvement of pharmaceutical education). Twenty years ago we summarized and presented at one meeting of the American Association of Colleges of Pharmacy or at the Drug Trade Conference, we do not recall which, a list of donations made by men of wealth directly or indirectly in the drug industry that had been made to various educational institutions. This sum ran well into the millions of dollars and *not one penny of it went to the pharmacy colleges.*

The fact seems to be that those who receive these donations are the ones who go after them most vigorously. The colleges of pharmacy have not been sufficiently vigorous in going after these gifts.

We had a most interesting conference just before we went away on our vacation with one manufacturer and representatives of the American Council on Pharmaceutical Education, the American Association of Colleges of Pharmacy, and the American Council on Education.

We were asked to arrange this conference by one of our large manufacturers who attended. Nothing definite came out of the meeting, excepting that this manufacturer suggested that we hold similar conferences with other large manufacturers in the pharmaceutical field, a number of whom were suggested.

We are very certain the suggested conferences may be arranged and we feel sure that quite a number of the larger manufacturers are taking an increasingly sympathetic interest in the problems of pharmaceutical education. We have been definitely advised that a number

of them are ready to contribute rather liberally to support some of the activities of recognized pharmaceutical educators.

Our own time is so taken up with routine work that we have not had time to devote to organizing these conferences. We want to help, however, and will do what we can to bring about further meetings in the event the pharmaceutical educators desire for us to do so.

E. L. NEWCOMB, Executive Vice-President,
National Wholesale Druggists Association.

Thank you for your letter of February 27th, re: *The American Journal of Pharmaceutical Education* and its relation to Boards of Pharmacy.

I fully realize the need of progressional study by board members of the rapidly changing status of pharmaceutical education. To keep up with the parade it is obvious that some form of official publication would be of great value to state officers charged with examination of applicants to practice in their respective states.

The New Hampshire Board as listed on this letter head is in sympathy with the program as in effect for the American Council of Pharmaceutical Education and is only too happy to subscribe to this journal of the American Association of Colleges of Pharmacy.

You will therefore enter subscription for three copies, one to each of the board members sent to their respective addresses as listed above.

GEORGE A. MOULTON, President,
Commission of Pharmacy, State of New Hampshire.

I have found the Journal so replete with good practical information of value to pharmacists and state board members concerning pharmaceutical education that I should like to encourage officers of the State Association and members of the Board of Pharmacy to read this regularly. While they are now very much interested in the School of Pharmacy and cooperate with us sincerely, I believe that they would appreciate an opportunity to become more conversant with the problems of pharmaceutical education and also with the work that is being done by the colleges.

B. V. CHRISTENSEN,
University of Florida.

I find your note in the last issue of the Journal in which you asked if there will be any news in regard to the Atlanta meeting.

We have selected our committees and are now working on the entertainment program. The women have also had an organization meeting but we have not yet covered all the details. We do know that on Wednesday night we will be the guests of the Coca Cola Company at dinner following the President's reception. I think this will be an occasion which will stand out in the memory of all present. On Thursday afternoon we plan to give a Georgia barbecue at around six o'clock after a tour of Atlanta's interesting points. The majority of our delegates have never participated in a real Georgia barbecue and this occasion also should be one to be remembered. We have not definitely arranged for Sunday evening, but we are hoping to have a large negro choir in Atlanta put on the musical pageant "Heavenbound". We thought this

might attract a number to arrange to come early and make the Sunday evening more attractive than it has been heretofore. In the event this is arranged, it will be held in the open-air garden of the Hotel and I think that this item will prove attractive. We are hoping to plan a day's trip for the women and as many men as may want to go to a town about forty miles from Atlanta where they can see cotton in the process of being picked, ginned and manufactured into various products. Another item that we are working on is the matter of a display of Georgia products in the Hotel, with information in regard to them.

Publicity is now going out to all the drug journals of the country and we are trying to interest the Associated Press in sending out some material. We also hope to have a program on the Atlantic Radio Station, WSB, as a part of the "Welcome South Brother" program which is now a weekly feature. In the event this can be definitely arranged, the date will be published so as to try to get as many individuals interested to listen as possible.

ROBERT C. WILSON,
University of Georgia.

I am grateful to you for writing to me about the Journal. As the youngest member of the Board in many years in this state, I am in need of all the assistance the Journal will offer. I enclose my check for the same.

As a student at the University of Wisconsin from 1926 to 1930, I came under the influence of Dr. W. O. Richtmann, Dr. Edward Kremers, and others of the younger members of the pharmacy faculty. I attempted to absorb more than the usual amount of training in professional pharmacy and as one consequence of my opportunities there I have an ever present yearning to read and to learn from the various fine journals published on the professional phases of pharmacy in our country.

And now as a board member, I find it increasingly important to learn "what the colleges of pharmacy are doing" as one of your subscribers puts it. My examination covers the field of chemistry and I realized only too well before I started out almost two years ago that I needed much help in making my examinations as fair, as practical, and as helpful as possible to the candidate in checking him up before he starts to practice.

If there are any other sources of information that will assist me in forming better examinations in chemistry, I shall certainly appreciate any advice you or your Journal editorial staff might have time and inclination to offer. You may count on me as a regular subscriber so long as I am eligible to be one. If our Board can be of any assistance at any time, please advise us.

PERRY CLARK,
Board of Pharmacy, Chillicothe, Missouri.

Most certainly the magazine is worth two dollars without any write-up concerning a mountain boy like me. It has been said, that the greatest goal in life is working hard to live up to what one's friends think they are, and in that direction I must bend my effort. Certain it is that I would be a strange character did I not appreciate what you and others

have seen fit to say, and at this belated moment let me thank you for the press comment.

I read the Journal from cover to cover and made some notes relative thereto which I may make use of at the district meeting at Richmond on Monday and Tuesday. You follow a line of reasoning and writing that is influenced with a more human touch than many journalists, especially in the educational field. As you know without my saying it, many feel that words must be cold and lifeless. That is not true. Dana, Watterson, Bennett, and even at least three editors from Nebraska have proven that there is a personal element in all fields.

It was nice of you to comment on the degree conferred upon me by our University. I am sure nothing that I ever did for my state really merited such attention. I take it more as a symbol for others that worked with me in various avenues, for without that help nothing could have been done. My work on the Highway Marker Commission, various phases of our state history, and the "resurrection" of documents, and the labor in the field of Galen—could not have been done without a lot of help from others. Among these, far from the least was the interest at all times of Dr. Boucher. He left here, just like other fine men have left public places, because other places saw how good they were, and to borrow from the vernacular of the street—just "gobbled them up." Because our state is small, and perchance a bit pinched financially is no reason things could have not been "upped" so no one else could take them away. Of course we have to try and spread influences around into other regions and I hope that some of the West Virginia contacts made by Dr. Boucher, coupled with the seasoned Nebraska influence, will make an already great school keep up a rapid forward pace.

Roy B. Cook,
West Virginia Board of Pharmacy.

I thank you for the October issue of the Journal and would like to know how I could secure the back numbers so as to make our file complete. The October issue is really illuminating and throws much light on problems of pharmaceutical education in the United States.

We are the only university in India imparting the degree of bachelor of pharmacy. The prospectus of our department is also sent to you under separate cover though some changes have been made since its publication and the new one will be sent to you when it is out in July next.

Our journal will give you, every quarter, the activities of our Association and the progress of pharmacy in India. I shall be glad to send you now and then matters for publication in the *American Journal of Pharmaceutical Education.*

Here in India practically no books on pharmacy have been published. We have to depend on books as published in England and America, but unfortunately we do not even know of many of the publications on pharmacy until after months or years have passed since their publication. I wish the publishers would inform us regarding books on pharmacy and allied subjects. I would be glad to announce such publications and review them therein if the copies of such publications were received by me. Suitable books may also be prescribed for use by our students here.

I again express my deep sense of appreciation for your kind co-

operation in our mission and I do hope that you and your colleagues in America will help us in serving the cause of pharmacy in India where it is the least developed.

Finally, I would welcome contributions from you and your colleagues for purposes of publication in our journal so as to keep the workers in this country informed of your activities. Further, will you kindly give me permission to reproduce any articles from your journal, provided of course we mention the source in our journal?

M. L. SCHROFF, Editor, *The Indian Journal of Pharmacy*,
Benares Hindu University, Benares, India.

While listening this afternoon (March 17) to a talk on synthetic new remedies by Dr. Schonle, Chief Chemist of Eli Lilly and Company, I had a full hour's leisure to reflect upon the status of pharmacy.

We naturally assume that the making of remedies is part of the art and science of pharmacy. But while the speaker referred repeatedly to organic chemistry, biochemists, physical chemists, pharmacologists, bacteriologists and medical practitioners, the words pharmacy or pharmacist not once crossed his lips. True, he did use the corresponding adjective once, when he referred to "the whole pharmaceutical gang", i. e., the pharmaceutical manufacturers interested in the research of medicinal chemicals.

I am fully aware that pharmacy has itself to blame. Beal once paraphrased the common saying about Ireland and the Irish when he said "The trouble with pharmacy is with the pharmacist". The pharmaceutical practitioner of today is no longer a pharmacopœius, i. e., a maker of remedies, but a pharmacopolus, a vender of remedies. Our colleges, so far as they were influenced by pharmacists, must share the blame. Pharmaceutical industrialists did not turn to the Chicago College of Pharmacy for their research men, for the simple reason that this institution, the oldest in the Northwest, was not interested in research. They had to turn to the University of Illinois, to the University of Chicago, and other institutions of higher grade for their scientists. No wonder that Dr. Schonle, a graduate of Urbana, does not think of pharmacy as a contributing factor to the research problems of the pharmaceutical manufacturing establishment that has hired him.

Years ago, at one of the Baltimore meetings, I was instrumental in establishing a Division of Pharmaceutical Chemistry in connection with the American Chemical Society. The chemist of our pharmaceutical manufacturing establishments were conspicuous by their absence. Then the "happy" thought occurred to some one to change the name to Division of Medicinal Chemicals. Since then the division has flourished at least numerically.

Finally, permit me to suggest that you compare the advertisements of our pharmaceutical manufacturers in "Science" and journals of similar standing with those that appear in our pharmaceutical trade journals. The former draw attention to the scientific attainments. The latter, with notable exceptions it is true, appeal to the commercial instincts of the pharmacopolus, the remedy vender. Eli Lilly and Company, while advertising in trade journals, refused to support the Pharmaceutical Archives with even a modest advertisement. Parke, Davis

and Company did likewise. There are others. The only firm which has so far advertised in the Archives is one whose trade is mostly with perfumers, etc., rather than pharmacists.

I know that you have written in like strain. If I write this evening it is not to persuade you or to ask you to publish this letter, but to relieve my feelings. Surely, we cannot blame the chemists if they ignore the past of scientific pharmacy as well as its present status if we remember that the average pharmacist has little or no use for present day science and less, if this be possible, for the scientific accomplishments of the past of his calling. He may recognize a money value in some of today's scientific accomplishments, but for the past he has little or no use whatever, because it no longer deposits dollars or cents in his till.

EDWARD KREMERS,
University of Wisconsin.

This is referring again to your recent letter concerning the article, "Profession of Pharmacy in Need of Recruits", which appeared in *Science News Letter*, February 25, 1939. (Reproduced in this issue of the Journal.)

Certainly in our area there is no shortage considered in terms of pharmaceutical service rendered. There are a few openings in drug stores for which there are no clerks available at the moment. Under the circumstances I feel it would be a mistake for our association to take official recognition of the situation.

R. A. KUEVER,
State University of Iowa.

There is every evidence that there is a shortage of registered pharmacists in Minnesota although I cannot believe that it is of such magnitude as to prevent the operation of a sufficient number of pharmacies from which good pharmaceutical service may be offered to the physicians and the general public. Furthermore, this shortage will not in any manner prevent the opening of quite a few new pharmacies. As a matter of fact, I am much more interested in improving the pharmaceutical service in the stores that we now have than in the opening of additional ones. A shortage in registered pharmacists is in itself a stimulus to more young people becoming interested in the pharmaceutical profession. I believe it to be a definite retrogression to attempt in any way to make up the present shortage by either, (1) lowering our standards for admission to pharmacy schools, which of course would necessitate simpler presentation in our curricula in order to take care of the lower intelligence level of the students with whom we would have to work, or (2) do so by advertising anything but the increased opportunities in the pharmaceutical profession. Only a few short years ago registered pharmacists were either walking the streets or working for $15.00 a week and now, because of economic conditions, the entire picture has changed. I firmly believe that pharmaceutical educational institutions should keep their "sights" high and not attempt in any of the other ways previously mentioned, to meet a variable condition over which we have no control.

CHARLES H. ROGERS,
University of Minnesota.

NOTES AND NEWS

Recent special lecturers at Fordham University, College of Pharmacy were Dr. Walter A. Bastedo, president of the United States Pharmacopœial Convention who spoke on "The Relationship of the Pharmacist to the Physician"; Dr. Raymond Ditmars, curator of mammals and reptiles at the New York Zoological Park who spoke on "Snake Venoms and Serums"; Dr. Charles Higgins discussed the methods of typing pneumonia germs and the use of specific type serums for the treatment of the disease; and Drs. Samuel Binkley and William C. Hoffman of the American Society for the Control of Cancer, discussed the preventability, the danger signs and the various types of cancer. Dr. Leonard J. Piccoli is using pictures in the teaching of physiology. The films used cover the structure and dissection of the abdominal wall, the anatomy, movements, and action of drugs upon the gastro-intestinal tract.

The Sixth Annual Convention of the Oklahoma Pharmaceutical Association was held on February 10th in the Pharmacy Building.

The December, 1939, meeting of the American Association for the Advancement of Science will be held at Columbus, Ohio. At that time the College of Pharmacy of Ohio State University plans to be host to the Subsection on Pharmacy. A graduate chapter of Kappa Psi was installed at Columbus in January, 1939.

The one hundred eighteenth anniversary of the founding of the Philadelphia College of Pharmacy and Science was celebrated on February 23. Dean Ernest Little of Rutgers University, College of Pharmacy, was the speaker on the occasion. He spoke on the subject, "A Glimpse of Pharmaceutical Education in 1939". An honorary degree, Doctor of Science in Pharmacy, was conferred upon Dean Little by the institution. More than a hundred pharmacists attended the Seminar on Modern Pharmaceutical Practice given at the Philadelphia College of Pharmacy and Science on January 30, 31, and February 1. The seminar was conducted by various members of the faculty.

A number of lecturers in special fields have been scheduled at the School of Pharmacy of George Washington University. They are: Mr. Carson P. Frailey of the American Drug Manufacturers Association, on industrial pharmacy; Dr. E. F. Kelly of the American Pharmaceutical Association, on pharmaceutical organization; Dr. James J. D. Durrett of the Food and Drug Administration, on drug control; Dr. Warren F. Draper of the Public Health Service, on public health; Lieutenant Colonel Albert W. Kenner of the Army Medical Corps, on military pharmacy; and Mr. Roland Jones, Jr., of the National Association of Retail Druggists, on pharmaceutical law. A plan is being developed to combine the alumni of the School of Pharmacy and of the School of Medicine under one organization. Under a grant from the John T. Lloyd Laboratories of Cincinnati, Professor Gramling is continuing a study of the pigeon emesis method for the assay of gelsemium.

Dr. L. Wait Rising, University of Washington, Seattle, has recently been elected to serve as vice-president of Rho Chi for the 1939-1941 term. He will be installed at the annual convention in August. Dr.

Loyd E. Harris, University of Oklahoma, was reelected national secretary-treasurer.

"The Badger Pharmacist", published by the Rho Chi Chapter of the University of Wisconsin takes no advertisements and has but few subscribers. These attempts to popularize pharmacy without cheapening it are financed almost entirely by the friends of the profession of pharmacy, neither its editor or secretary-treasurer of Rho Chi receive any remuneration for their work.

Dr. Arno Viehoever, Research Professor of Biology at the Philadelphia College of Pharmacy and Science, has been invited by the Siamese Government to go to Bangkok as a scientific advisor. While there he will be affiliated with the ministry of Economic Affairs and associated with Dr. Toa Lababuksom, Director General of the Department of Science. His task will be that of organizing and directing a special research unit, to explore, evaluate, and utilize domestic curative and nutritional agents, in which the country abounds. Dean Ivor Griffith has been elected a fellow of the Royal Society of Arts, one of the oldest scientific organizations in Great Britain.

Dr. H. A. B. Dunning, director of the research laboratory and president of Hynson, Westcott and Dunning, Baltimore, has given $50,000 toward the construction of a research laboratory for the department of science of Washington College, Chestertown, Maryland. An initial gift of $50,000 towards the library was made some time ago by Dr. George A. Bunting of Baltimore.

Dr. D. W. Morehouse, President of Drake University, has announced that the Des Moines College of Pharmacy has been absorbed by the University. The equipment of the old school will be moved into Science Hall which is being remodeled to accommodate the new work. Dean E. O. Kagy, Dr. J. B. Shoemaker and Professors J. E. Galloway and Lee Worrall will be added to the Drake faculty. President Morehouse states that he proposes to make the new college standard in every respect.

The General Assembly of the state of Tennessee has just passed a bill and it has been signed by the Governor requiring on and after January 1, 1941, all applicants for licensure to be graduates of a recognized college of pharmacy under rules established by the Tennessee Board of Pharmacy.

Dr. Charles A. Kofoid, Professor Emeritus of Zoology at the University of California, conducted a biology colloquium at the Oregon State College at Corvallis on March 4. The colloquium was sponsored by Phi Kappa Phi, Sigma Xi and Phi Sigma. The pharmacy faculty are taking part in a new State College radio program entitled the Oregon State College Hour. The construction and equipping of the new chemistry building is under supervision of Dr. F. A. Gilfillan, formerly of the School of Pharmacy, but now acting dean of the School of Science.

Loyola University, New Orleans, recently presented a suitably inscribed scroll to each of six faculty men who have completed twenty-five years of service. Dean Emeritus John J. Grasser, and Dr. J. O. Weilbaecher of the College of Pharmacy were among those honored. Two freshman girls, Peggy Lou Butcher and Rose Mary Beitin were on the University's semester honor roll with the designations Maxima Cum Laude and Magna Cum Laude respectively.

The Sixth District, (Boards) and Colleges met at Oklahoma City on March 8 and 9. Resolutions passed covered the abolition of the Qualified Assistant, making radical changes in the board examination methods so that practical work shall dominate the examination and that the theoretical and scientific work of the colleges be sufficient, and that state boards of health have a pharmacist in both an administrative capacity and in actual field work.

Dean R. A. Kuever of the State University of Iowa gave two addresses on February 7. He spoke before the Minnesota Pharmaceutical Institute on the subject "Peculiar Prescriptions" and before the Northwest Branch of the American Pharmaceutical Association on "Our Pharmaceutical Times". Dr. James W. Jones spoke before the Ice Cream Section of the Dairy Industry Week Program at the Iowa State College on February 24. The topic was "Colors and Flavors in Ice Cream". The Third Annual Pharmaceutical Symposium for the pharmacists of Iowa sponsored by the College of Pharmacy, the Iowa Academy of Pharmacy and the Iowa Pharmaceutical Association was held at Iowa City on March 16 and 17. At the conclusion of the program twenty-eight certificates of fellowships in the Iowa Academy of Pharmacy were awarded and one honors fellowship was given to Mr. J. W. Newfeld for fifty-three years of distinguished professional service to the advancement of pharmacy in the state of Iowa.

Dean Emeritus Heebner of the Ontario College of Pharmacy died early in December. Pharmaceutical educators on this side of the border extend sympathy to their Canadian colleagues at the loss of a great pharmaceutical leader.

Dean Henry S. Johnson of the Connecticut College of Pharmacy, addressed the professional section of the Connecticut Pharmaceutical Association at the mid-winter meeting at Hartford on "What Our College Can Do for the Pharmacist". He was also elected treasurer for Province II of the Kappa Psi fraternity at the March meeting at Newark, New Jersey. In March the annual demonstration in pharmacy for students of the Yale Medical School was given by Professor Augustus A. Maier and Mr. Nicholas W. Fenney.

The Fourth Annual Pharmaceutical Symposium sponsored by the School of Pharmacy of the Medical College of Virginia was held on March 8. Papers were presented by Dr. E. F. Kelly and Mr. A. L. I. Winne dealing with socialized medicine and by Dr. J. R. Main who discussed the physiology of the endocrine glands and by Mr. W. G. Tarrant, Jr., who spoke on the commercial products now on the market. The Mortar and Pestle Club has begun the publication, quarterly, of a school paper, called the *Medical College of Virginia Pharmacist.*

Eli Lilly and Company of Indianapolis have had as their guests the students from the School of Pharmacy of the Medical College of Virginia and the Massachusetts College of Pharmacy. Parke, Davis and Company were also hosts to the latter group as well as to the students of the College of Pharmacy of the University of Nebraska. The Abbott Laboratories of Chicago also entertained the Nebraska group.

As a result of the examination held November 14 to 18, 1938, the following candidates have been selected for appointment as Second Lieutenants in the Medical Administrative Corps, Regular Army; Claude

Dale La Fors, Bellingham, Washington; Bernard Korn, Brooklyn, New York; Ennis Dallas Sandberg, Kansas City, Kansas; James Thomas Richards, Austin, Texas.

The Proctor and Gamble Company has provided a $1000 fellowship in the School of Pharmacy of Western Reserve University for the further study of the irritant action of soaps on the human skin. The fellowship for the coming year has been awarded to Byron E. Emery of the University of California, 1937, who is now doing graduate work at Western Reserve.

The Wayne County Medical Society through its organ the Detroit Medical News, under date of March 13, 1939, expresses its appreciation for the help given it in an educational campaign by the druggists of Detroit. To date they have distributed through their stores, twenty-seven thousands pieces of literature containing messages of health and medical care; twenty-five thousand more will be distributed in the next few weeks by the same avenue.

The third Pharmaceutical Institute of the University of Minnesota was held in the Center for Continuation Study on February 6, 7 and 8. Attendance was large and five states were represented. The faculty consisted of members of the staffs from the schools of Pharmacy, Business Administration, Chemistry and Medicine, the Department of Physics and the following special lecturers: Mr. E. J. Boberg, Eau Claire, Wisconsin; Mr. F. E. Bibbins, Indianapolis, Indiana; Mr. L. A. Seltzer, Detroit, Michigan, and Dean R. A. Kuever, Iowa City, Iowa. Dean Charles H. Rogers recently spoke before the staffs of St. Barnabas and neighboring hospitals upon the subject, "The Theory and Postulations Advanced for the Action of Sulfanilamide and Its Derivatives". Professor Earl B. Fischer spoke before the Mother's Club of Unity Settlement House upon "Marihuana". Mr. Charles Smythe spoke to the Episcopal students of the University upon "Drugs of the Bible".

The Cincinnati College of Pharmacy is sponsoring a series of evening lectures in pharmacy and allied subjects in conjunction with the Cincinnati Academy of Pharmacy. To date, Professor E. H. Phlogman has spoken on the subject, "Prescription Problems", and Dr. M. W. Grenn has discussed the "Problems of Biochemistry to Pharmacy".

Announcement is made by the Board of Trustees of the United States Pharmacopœial Convention of the completion of the Spanish Edition of the United States Pharmacopœia, XI. The translation was done under the auspices of the Pan American Sanitary Bureau in Washington with auxiliary committees of Cuba, the Philippines and Puerto Rico collaborating. The translation is now official in Costa Rica, Nicaragua (together with the French Codex), Panama and the Dominican Republic.

New Subscribers to The American Journal of Pharmaceutical Education

(Continued from page 262)

Sears, Carlton I., Olympia, Wash.; Sister M. Felicie, Minneapolis, Minn.; Sorg, N. F., Iowa City, Ia.; Stevens, William S., Columbus, Ohio; Stinson, Ray C., Pembina, N. D.; Stoner, W. H., Bloomfield, N. J.; Swisher, Margaret C., Buffalo, N. Y.

Taylor, Irving, Trenton, N. J.; Treeman, Lewis G., Buffalo, N. Y.

Vadham, Joseph, Tyler, Minn.; Vick Chemical Co., New York City, N. Y.

Whitney, H. A. K., Ann Arbor, Mich.; Wilson, Charles O.. Washington, D. C.; Winne, A. L. I., Richmond, Va.

MISCELLANEOUS ITEMS OF INTEREST

Documents Pertaining to the History of Pharmacy in the United States

Grants-in-aid from the income of the Hollister Pharmaceutical Library Fund, for which the Wisconsin Historical Society is trustee, have made possible the reproduction of the following documents in *The Badger Pharmacist*:

1. "Receipts to cure various disorders. For my worthy friend Mr. Winthrop. 1643", was published in No. 15, issued April, 1937. Besides a facsimile reproduction of the manuscript in possession of the Boston Medical Library Association, the Comments of Oliver Wendell Holmes from the Proceedings of the Massachusetts Historical Society, were quoted. This medico-pharmaceutical guide for the early settlers of Massachusetts Bay Colonoy was based on herbals popular at that time.

2. "The Lititz Pharmacopœia" was published in Nos. 22 to 25, issued December, 1938. Opposite the facsimile reproduction of the text appears the English translation. The Latin and English texts are explained by footnotes. In addition to an historical introduction, there appears for the first time an analysis of the materia medica involved in the formulas.

3. There is now in preparation "A drug list of King Philip's War, 1675". This will appear in the February, 1939, issue of *The Badger Pharmacist*. If, as pointed out, Governor Winthrop's guide was based on popular herbals, the medicaments called for by Surgeon Locke represent for the most part, drugs and preparations listed in the London Pharmacopœia of 1650, hence represent professional medico-pharmaceutical practice.

It thus becomes apparent that three early, if not earliest, documents of greatest importance to the student of the history of pharmacy have been made available.

Sets of the three documents can be had for one dollar each. The price barely covers the cost of production. It is to be hoped that both teachers of the history of our calling and students in their classes will avail themselves of this opportunity to secure sets of these three documents while the limited supply lasts.

EDWARD KREMERS,
University of Wisconsin.

The Award of Certificates to New Pharmacists in New Jersey

Governor A. Harry Moore awarded certificates of registration to fifty-three newly registered New Jersey pharmacists at the State House

in Trenton on Thursday, February 9. The exercises incident to this award were presided over by Mr. John J. Debus, President of the Board, and addresses were made by Dr. Robert C. Clothier, President of Rutgers University, with which the New Jersey College of Pharmacy is affiliated; Mr. James A. Bauman, Vice President of the Board, who spoke on important phases of the Pharmacy Law; and Dr. Robert P. Fischelis, Secretary of the Board, who also introduced the speakers.

The three chapters of the Code of Ethics of the American Pharmaceutical Association were read by Messrs. Adolph V. Palumbo, Charles Schamach and Percy H. Jackson, members of the Board, and all of the new registrants signed the Code.

In his address to the registrants Dr. Clothier dwelled on the importance of assuming the responsibilities with which the State entrusts pharmacists.

Governor A. Harry Moore, in personally awarding the certificates of registration to the fifty-three registrants, urged them to adhere to the high ethical standard which has been set by the profession and by law.

Mr. Harry A. Reibel, President of the New Jersey Pharmaceutical Association, gave a brief message to the new registrants on behalf of that Association, and the entire Board of Trustees of the Association was in attendance at the exercises. Other distinguished visitors who attended included Dr. J. Leon Lascoff, President of the American Pharmaceutical Association, Dr. William C. Anderson, Dean Emeritus of the Brooklyn College of Pharmacy and a member of the New York Board of Pharmacy, and Dr. Ernest Little, Dean of the New Jersey College of Pharmacy.

These exercises marked the seventeenth time that certificates of registration have been awarded publicly to newly registered pharmacists in New Jersey.

ROBERT P. FISCHELIS,
Secretary of the Board.

Profession of Pharmacy in Need of Recruits

In these days of overcrowded ranks in many professions, it is both interesting and gratifying to learn that one of the oldest, pharmacy, is sending out a call for recruits—not to swell the ranks of clerks in department drug stores, but to join the physicians in healing the sick.

A shortage in the supply of "properly qualified pharmacists available for active service and professional practice" exists in New Jersey, Delaware and Pennsylvania, the Philadelphia College of Pharmacy and Science reports.

Part of this shortage is due to more astringent requirements for entrance to pharmacy colleges, more rigid regulations of pharmacists by state boards and the lengthening of the professional course in pharmacy to four college years. Another factor is the general economic improvement which has caused a return of pharmaceutical retail practice to predepression levels and which has increased the demand for trained pharmacists in other fields.

On the economic side, a career in pharmacy looks bright. It will

be at least four years, it is estimated, before enough new pharmacists have been trained and registered to fill the present demand. Encouraging also is the fact that while wage levels in pharmacy dropped during the depression, there was almost no unemployment.

Filling prescriptions or performing other duties in retail pharmacies is by no means the only occupation open to pharmacy graduates. About one-third of the graduates of schools of pharmacy become retail store owners, a survey showed. Nearly another third are employed in such stores. The remaining third are listed as industrial owners, executives, teachers, research workers, physicians and other professional men, technical organization and journal executives, manufacturer's representatives or as having engaged in a host of other related occupations.—From *Science News Letter*, February 25, 1939.

(Many are questioning the truth of the statement concerning the shortage of druggists as made in this quotation. Note statements in this number by Deans Rogers and Kuever of Minnesota and Iowa respectively. Furthermore, a paucity or an excess in one or several parts of the country is a common thing at any time. As a matter of fact the reciprocity records show that last year the drift out of Pennsylvania was about six times greater than the drift into the state; that does not look like scarcity in Pennsylvania. These inequalities of distribution are cared for by reciprocity. A state which refuses reciprocity may find itself in difficulty in making adjustments.—Editor's note.)

Designating Colors

Scientists are attacking one of the most difficult of all jobs known to man—the task of bringing some semblance of order out of the chaos of terms designating colors. Baby blue, sky blue, Eleanor blue and other terms much more fantastic may be useful as words, but they tell nothing about actual colors. And yet colors and their proper scientific designation are most important in many fields; in medicine, papermaking, textiles, industry generally, lighting, psychology and fashion.

It was only a few years ago that colorists found there were fifty-nine different colors all designated by the same name on the color charts of manufacturers. And, in another case, there were forty-seven quite similar colors all designated by different color names.

At the meeting of the Inter-Society Color Council reports were made of the newest advances in building up a true simple chart of colors which would replace the hodge-podge of names now used except for advertising purposes.

Dr. E. N. Gathercoal, of the University of Illinois, School of Pharmacy, described the usefulness of proper color terms for medicine, particularly the description of drugs by their color. In the U. S. Pharmacopœia, Dr. Gathercoal said he had seen the term "blackish white" as a color designation for a drug. The use of so startling and yet meaningless term set scientists to a study of colors indicated in this standard formulary of drugs. About 2,500 color designations were found. Great simplification of color designations has now been found until the number of terms needed is only a few and variations of shades are possible by use of a careful list of a few qualifying adjectives.—ROBERT D. POTTER. From *Science Supplement*, March 3, 1939.

Joint Committee on Accrediting
representing
Association of Land-Grant Colleges and Universities
and
National Association of State Universities[1]

Gainesville, Florida
February 9, 1939

TO THE PRESIDENTS OF STATE UNIVERSITIES AND LAND-GRANT COLLEGES:

You have been furnished a report of the Joint Committee on Accrediting representing the Association of Land-Grant Colleges and Universities and the National Association of State Universities, together with copies of the resolutions which were passed by the two associations at their respective annual meetings in Chicago.

The Joint Committee was instructed by both associations "to prepare for members of this Association a list of the approved agencies with which the members are encouraged to cooperate. It is understood that the agencies seeking to institute accrediting procedures must first secure the approval of this standing committee."

Your standing committee met on February 2, 1939, in Washington, D. C., and gave long consideration to this problem. It was the concensus of opinion of the Committee that it could collect the information and give advice to the institutions concerning new accrediting agencies without much difficulty, but to make a list of acceptable, existing agencies would require a great deal of study, possibly travel and investigation, and expense. Furthermore, the Committee on Accrediting would probably expose itself to the same criticisms and objections that are now being raised by it against accrediting agencies. Therefore, your Committee feels that it must proceed with care and caution. At the present time we feel that each institution will have to assume its own responsibility in working with the accrediting agencies; however, we are accumulating information all of the time about these agencies and will gladly furnish such information as we have to institutions making inquiries.

As a first step in classifying desirable accrediting agencies, the Chairman of the Committee has been instructed to gather additional information from the institutions; this constitutes the principal purpose of this letter. I send you herewith two lists:

(1) Specific criticisms or objections which your Committee feels now exist with reference to accrediting agencies; and
(2) A list of accrediting agencies.

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[1]This report has been distributed to the administrative officers of state universities and land-grant colleges. It is of great importance to colleges of pharmacy and accrediting institutions.—Editor's note.

You are asked to supplement both lists. If there are other criticisms or objectionable practices which are not listed, please note these on a separate piece of paper and do likewise with the list of accrediting agencies, and then return the supplementary lists to me at your earliest convenience.

A conference with the representatives of accrediting agencies is to be held in Washington in the near future, probably the latter part of March or early in April. This conference is to be held under the auspices of the American Council on Education and has been called at the request of the two associations which our Committee represents. Your Committee is to participate in this conference and we desire the information that we are here asking as a basis for a statement and discussion which we expect to present at the conference. Therefore, we urge you to send in this supplementary information as early as possible. It must be in our hands in the next month if it is to be of value.

We thank you for your cooperation.

Cordially yours,
(Signed) Jno. J. Tigert
Chairman.

General Criticisms or Objections Which the Joint Committee Offers Concerning Accrediting Agencies

1. There are too many accrediting agencies. Furthermore, accrediting began largely on an institutional basis, was extended to colleges or schools within an institution, and now is getting on a departmental or single curriculum basis.

2. The accrediting agencies are invading the rights of the institutions and destroying institutional freedom. This, in some instances, is a violation of law and a usurpation of the powers vested in boards of control. This applies not only to finances, but also to educational programs.

3. Accrediting agencies tend to put institutions in a straight-jacket. Uniformity in American colleges has undesirable aspects.

4. The costs of accrediting are becoming excessive. These involve not only amounts in money that are levied upon the institutions for the purpose of paying for visits and studies, but also time spent in travel and other burdens placed upon the staffs of the institutions who participate in the accrediting, making and filling out questionnaire, etc.

5. There is too much duplication. Examples are found in regional, national and departmental conflicts.

6. In some institutions accrediting agencies do not confine themselves to a study of the particular field in which they are engaged. There is a disposition to investigate other departments of the institution and make recommendations concerning them.

7. The recommendations and requirements of accrediting agencies frequently result in throwing the budget and the educational program of the institution out of balance by requiring disproportionate expendi-

tures and laying undue emphasis on colleges, departments or curricula in which particular groups are interested.

8. The standards of accrediting agencies are now largely outmoded. For example, they tend to be quantitative rather than qualitative, i. e., they set up external, mechanical items that are measureable (number of faculty, size of library, floor space, amounts of money expended) rather than an actual evaluation of the kind of work that is done.

9. Something of the guild system or trade unionism seems to be invading the movement. Practitioners, professional and vocational groups who are already engaged in practice or the professions are attempting to dominate those who are responsible for education; for example, doctors, chemical engineers, lawyers, etc.

(The above constitutes a very general statement of objections which your Committee believes exist with reference to accrediting agencies. We are now asking that you make additional statements of objectionable practices which you may have incurred in your relations with any of the accrediting agencies. We would appreciate it if you would mention the particular accrediting agency, if you so desire, in order that we may know of their objectionable practices. This would be of great value to our Committee in attempting to discover the agencies that we should not continue to cooperate with.)

List of Accrediting Agencies

American Association of Collegiate Schools of Business.
American Association of Collegiate Schools of Nursing.
American Association of Schools and Departments of Journalism.
American Association of Schools of Social Work.
American Association of University Women.
American Bar Association.
American Chemical Society.
American Council on Pharmaceutical Education.
American Library Association.
American Veterinary Medical Ass'n.
Association of American Universities.
Association of Collegiate Schools of Architecture.
Council on Dental Education.
Council on Medical Education and Hospitals of the American Medical Association.
Engineers Council for Professional Development.
Joint Committee of the National Association of State Universities and the Association of Land-Grant Colleges and Universities.
Middle States Association of Colleges and Universities and Secondary Schools.
North Central Association of Colleges and Universities and Secondary Schools.
Society of American Foresters.
Southern Association of Colleges and Secondary Schools.
National Association of Schools of Music.
American Institute of Chemical Engineers (operating through the E.C.P.D.).

The American Association of Colleges of Pharmacy.
American Association of Dental Schools.
Society for the Promotion of Engineering Education.
American Nurses Association.
Conference of Theological Seminaries and Colleges.
The American Association of Theological Schools.
American Association of Junior Colleges.
Association of American Law Schools.
Association of American Medical Colleges.
New England Association of Colleges and Secondary Schools.
Northwest Association of Secondary and High Schools.
American Association of Social Workers.
(Please supplement the foregoing list with the names of any additional accrediting agencies with which you may have had negotiations.)

The Richmond Meeting

The American Association for the Advancement of Science held its annual mid-winter meeting in Richmond during the Christmas holidays. It was the first time this group had met in Virginia and it was largely due to the efforts of Dean W. F. Rudd. Nearly 6,000 scientists and their friends attended the various meetings and sessions.

It is of interest to know that pharmacists had an important part in planning and staging the convention. Mr. L. C. Bird was chairman of the general planning committee. Mr. William Clift was chairman of the committee on transportation, registration and information. Dr. S. S. Negus was in charge of publicity and public relations. Dr. H. B. Haag was chairman of the advisory committee of the Virginia Academy of Science. Dean W. F. Rudd was chairman of the general advisory committee. Dr. W. G. Crockett was chairman of the committee of cooperation of the sections of the American Chemical Society. Mr. Frank Pitts was subchairman of the committee on meeting places. Mr. Roscoe D. Hughes was in charge of demonstrations for zoology, parasitology and embryology and Mr. T. D. Rowe was in charge of information for the Medical College Center. It is not because these individuals are, or have been connected with the School of Pharmacy of the Medical College of Virginia that makes this information of interest, but because they are either pharmacists or closely connected with pharmacy and by taking leading parts in the affairs of the Association they are contributing much to its prestige.

The program of the Subsection on Pharmacy was well attended. Space is too limited to record all of those present. There were representatives from Florida, North Carolina, Maryland, Pennsylvania, Ohio, New Jersey, Georgia and Virginia. The Subsection is relatively new and has fine possibilities and should grow in importance. The writer suggests that future programs should deal with strictly pharmaceutical problems.

THOMAS D. ROWE, School of Pharmacy,
Medical College of Virginia.

A Request

A study of what is being taught in America as dispensing pharmacy and how the material is being presented is a part of the program of the Problems and Plans Committee.

This investigation is comprehensive to the point of even seeking the cost of materials per student and the number of prescription items he handles during his training.

The study is attempting to bring together in one monograph the opinions of the personnel in every department of dispensing pharmacy in the United States concerning the training in compounding prescriptions. It aims to present to the body academic a truly complete picture of contemporary dispensing.

If the work develops as planned, its value to everyone in teaching will be considerable. It can become so only through whole-hearted cooperation by everyone who is asked to contribute data. This has been requested by means of a questionnaire submitted to each College of Pharmacy. To date fifty per cent of the Colleges have replied and invariably these have been generous to the extreme in unselfish helpfulness.

Will those who have procrastinated unearth the questionnaires and answer them in the spirit in which they were devised? Make the final report 100 per cent rather than 50 per cent representative. We will all profit from its content in direct proportion.

To those whose time and energy has already gone into the study, sincere thanks from the committee.

L. WAIT RISING,
University of Washington.

Fellowships, Scholarships and Assistantships for 1939-1940

The following positions have been reported as available for the coming year.

Western Reserve—Two $500.00 graduate assistantships in hosiptal pharmacy. One $1,000.00 fellowship—Proctor and Gamble Co., (already awarded for '39-'40.)

University of Buffalo, College of Pharmacy—One $500.00 fellowship and fees.

University of Florida, School of Pharmacy—Several graduate assistantships of $450.00 and partial remittance of fees.

Massachusetts College of Pharmacy—One fellowship in pharmacy $800.00 first year, $1,000.00 second year. One fellowship in materia medica $800.00 first year, $1,000 second year. Two fellowships in chemistry $800.00 first year, $1,000.00 second year.

North Dakota Agricultural College, Division of Pharmacy—Two assistantships of $450.00 and $135.00 respectively. Awards to freshmen

and sophomore students—a total of $60.00 given by the North Dakota Pharmaceutical Association.

University of Nebraska, College of Pharmacy—Two graduate assistantships of $500.00 each and fees.

The Lititz Pharmacopoeia[1]

GEORGE URDANG
Flushing, Long Island, New York

The Badger Pharmacist bears no name announcing an editor or an author. But that anonymity means no concealment. It represents the proud modesty of a man so intent upon his work that he and the work become identical. The Badger Pharmacist is the only unique American pharmaceutico-historical periodical and it and its creator, Dr. Edward Kremers, are an inseparable unity. The Badger Pharmacist is unique in America because its creator deliberately leaves the field of the "curious lore" to others. If this periodical had a motto, it would read, "History Instead of Story". Should the attempt to make the history of pharmacy in America a science instead of a hobby become a success, the Badger Pharmacist has paved the way. Its newest gift is of special importance for the history of American Pharmacy. It is a photographic reproduction of the first edition of the so called Lititz Pharmacopœia accompanied by a translation of the Latin text into English and a very careful commentary.

There has always been some mystery as well as dignity surrounding the Lititz Pharmacopœia after its first publication. The booklet was entirely forgotten and remained in obscurity for more than one hundred years. The authorship of the little work has been questioned although it was not commented upon in the second edition published in 1884 by Professor Maisch, nor the facsimile reproduction by Joseph W. England in the First Century of the Philadelphia College of Pharmacy, nor in a later reprint by Eugene G. Eberle, Editor of the Journal of the American Pharmaceutical Association.

The work of Doctor Kremers fills the niche. Like every real research work it destroys the mystery but it emphasizes and proves the dignity of this first official American formulary.

The arrangement of this publication is exemplary. The respective parts of the photographic reproduction of the Latin text and the translation are placed on opposite pages and accompanied by explanatory comments printed between the original text and the translation. Thus the comparative reading and the understanding is facilitated to a very high degree. There is scarcely one point of possible interest which has not received the most careful attention. The translation is not only simply given but the doubtful parts are discussed. The formulas and their ingredients are considered with respect to their efficiency in keeping with the medical practices of the time,—the last third of the eighteenth century. Consideration is also given to the temporary circumstances which may have influenced their choice and

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[1]A review written by Dr. George Urdang at the request of the Editor.

modification. The comparison with the authoritative contemporary pharmaceutical literature was naturally the only way to achieve that result. The Lititz Pharmacopœia itself gives evidence that the London and the Edinburgh Pharmacopœias are its most important sources of information. In some cases where it does not give formulas for the manufacture of certain preparations it refers to these pharmacopœias for instructions. Dr. Kremers made the 1746 edition of the London Pharmacopœia and the 1774 edition of the Edinburgh Pharmacopœia the basis for comparison. In addition Quincy's Complete English Dispensatory of 1782 and many other reference books and dictionaries were used.

In the Lititz Pharmacopœia the drugs, chemicals and preparations are classified according to different points of view as follows:

1. A list of the groups of preparations, 84 for internal and 16 for external use, giving a comparison between the number of preparations belonging to each group in the Lititz Pharmacopœia and the two English pharmacopœias.
2. A table of the preparations for which the Lititz Pharmacopœia does not give formulas but refers to the two English pharmacopœias.
3. A list of the provided Quid pro Quo preparations, i.e. of official substitutions.
4. A list of the preparations which were not to be dispensed in the hosiptal dispensaries but in the general laboratory.
5. An alphabetical list of the simples, contained in the Lititz Pharmacopœia and of the preparations which, as such, enter into other preparations.
6. Lists of the simples of mineral, of vegetable and of animal origin.

The author makes the following introductory remarks concerning these lists:

"Apparently the author of this small hospital formulary did not consider it worth while to prepare a list of simples, a materia medica list. Yet the student of the history of pharmacy will be especially interested in such a list for it must reveal what items of the materia medica were available during these trying times. The war had been conducted for three years when this hospital formulary was compiled. Necessity dictated that the author make use of as many native products as possible. It will be of interest, therefore, to learn on the one hand which American drugs were being utilized, also which chemicals were being manufactured in the thirteen colonies that constituted the original United States. On the other hand, the list ought to reveal which drugs and chemicals were being imported in spite of the attempted blockade by the British."

With these short remarks we have the entire program as well as the whole picture. We see the necessities of "these trying times" and their pharmaceutical consequences and we recognize the importance of the work of Kremers.

It is understood that such an investigation can be confined to details or isolated facts or can bring out by the details the spirit and the definite stage of development within the respective periods, thus fulfilling the real task of history. Whether the one or the other result is achieved depends upon the personality of the investigator, or his personal background.

It may suffice to state that here a personality with the required and desired human and scientific background was at work.

It seems to be unnecessary to go too deep into details. The teacher and the student of the history of pharmacy find here rich and incontestable material for discussion and for topic writing. There are only a few points which require some comments.

The very thorough translation of the Latin text prepared by Sister Mary Francis Xavier of Mount Mary College, Milwaukee shows in the very beginning, how much such work requires a knowledge of the language and of the historical background. The real meaning of some expressions is only understandable if we know their traditional use within the respective period.

The booklet was, to use the words of Dr. Kremers, "not intended as a general American pharmacopœia but as an emergency military hospital formulary." The use of the term "pharmacopœia" for formularies devoted to military hospitals, however, was common in the 18th century. We know a "Pharmacopœia Militaris in Bavariae Novocomiis Usitata" (1754), a "Pharmacopœia Castrensis Borussica" (1790) and so on. Thus the translation of "pharmacopœia" with "Repertory", used by Professor Nevin in his translation of the second edition (see page 6), can by no means be adopted. The only possible translation is formulary.

Formulary of what? The Latin text reads: "Pharmacopœia Simpliciorum et Efficaciorum". Sister Xavier points out that here the word "Remediorum" (remedies) is implied. That is doubtless right. But another word is, in my opinion, implied too, namely the word "tamen" (yet) behind "et". Thus we come to the following translation: "Formulary of Simple and Yet Efficacious Remedies." There is no reason for the assumption that the author of the formulary intended to follow in the title of the booklet the usual custom of many real pharmacopœias of that period to differentiate between "Simplicia" (Simples) and "Composita" (Preparations). In this formulary such a contrast would have been meaningless. The circumstances forced the author to restrict himself to simple remedies and it is understood that he wished to express that they were indeed "simple" but nevertheless "efficacious."

A further problem we meet in the translation of the second paragraph of the introduction (page 8). The word "recipiens", derived from "recipere", has several meanings. The translation "patient" (receiver of remedies), used by Professor Nevin, is not very suitable in our case. Sister Xavier translates the word as "prescription". That translation, however, is very unusual. There is a Latin idiomatic phrase "recipere in usum", "to take in use", that seems to give the real meaning for our purpose. Thus we come to the following translation:

"Most of the formulas provide solids or dry substances which can be employed more conveniently or at least more fittingly even if there would not be a particular lack of phials; likewise we omit, in order to avoid the inconvenience of transportation, all preparations which are less efficacious than those we have taken in use or which are only employed on account of the elegance of their application,

such as simple waters, etc., and various plasters and unguents, hardly necessary or useful."

(Latin text: Plurimae sunt formulae solidae et siccae quae commodius vel saltem elegantius liquida forma adhiberi possent, nisi defuerit imprimis phialarum copia et omnia, quae minus efficacia, pro recipientibus vel causa elegantae tantum usui sunt, quales aquae simplices etc. variaque emplastra et unguenta vix necessaria aut utilia, transportandi incommodo vitare velimus.)

The comment.

Of the many interesting notes concerning the drugs and preparations in the "Lititz Pharmacopœia" the statement that Senega (page 43) and Serpentaria (page 69), these typically American drugs, are not listed in the London or the Edinburgh Pharmacopœia of those days is the more amazing as both drugs are listed in the famous Pharmacopœia Wirttenbergica 1754. It seems that the German pharmaceutical scientists were more interested in the medicinal gifts of the new world than the happy proprietors of the young colony.

Often the author states that some preparations as decoctions, gargles, injections and so on, which we find in the Lititz Pharmacopœia are not listed in the London or the Edinburgh Pharmacopœia. This fact, however, means no difference between European and American custom but, in my opinion, only between the pharmacopœias for the general use of the civilian physicians and pharmacists and the formularies for the use of hosiptals.

The general pharmacopœias are mostly restricted to formulas for remedies usually in stock in the pharmacies and very seldom give formulas for remedies which usually are prescribed by physicians with changing contents and proportions. The formularies for the use of hospitals give, on the contrary, mostly prescription formulas.

Finally, I found two misprints. On page 21 is the preparation containing Hordeum perlatum, not "6. Bolus Volatilis," but "3. Aqua Hordeata." On page 65 in the last sentence in note 3, replace the word "silver" by "quicksilver."

The general interest in history, a characteristic feature of our time, has also found its expression in pharmacy. The number interested in this special field of pharmaceutical endeavor is steadily growing. Even the practitioners of pharmacy have become aware that it belongs to the concept of a profession to know, to estimate and to utilize its history.

Publications like the Lititz Pharmacopœia are the best proof of the importance of the history of pharmacy. They show that pharmacy is closely related not only to a series of other sciences such as medicine, botany, chemistry and biology, but also to the country in which it is practiced. Such facts can, yes, must be used!

The four year course in the American colleges of pharmacy has made the addition of cultural subjects a necessity. What cultural subject could be more appropriate than the history of pharmacy. The fact is, however, that we find in many colleges as cultural subjects, the history of civilization but not history of pharmacy. The reason is that academic groups do not recognize the history of pharmacy as a "cultural subject" suitable to replace history of civilization, or to share the field with it. It is our task to achieve for the history of pharmacy the appreciation which it deserves.

New Books

THE 1938 YEAR BOOK OF GENERAL THERAPEUTICS,—edited by Bernard Fantus, M.S., M.D., Professor of Therapeutics, University of Illinois College of Medicine; Committee on Revision of the United States Pharmocapoeia, and of the National Formulary Revision Committee; Director of Therapeutics, Cook County Hospital and Aaron L. Goldberg, M.D., Assistant in Medical Dispensary, University of Illinois. 1939. 554 pages. 44 illustrations. The Year Book Publishers. Price $2.50.

The 1938 Year Book measures up to its usual standard of excellence. In its preparation the Editor scrutinized approximately 2000 articles and selected 474 of them for review. Each article reviewed was subjected to two questions: 1. "Is it new?" 2. "Is it sound?—has it been proven clinically—is it ready for application in the average conditions of progressive practice?" The book covers the developments in the therapeutic field for the newer drugs and newer methods of treatment, (Sulfanilimide, the vitimins, endocrines, newer forms of insulin, anesthetics, requirements in transfusion, technique, methods and indications for injection-therapy) for the physician in every day practice. It is invaluable to the pharmacist as it gives him the trends in newer remedies. It should be in every pharmacy library and in the hands of the practicing pharmacist.

RUFUS A. LYMAN.

PROBLEMS OF AGING, edited by E. V. Cowdry,—Washington University, St. Louis. 1939. 758 pages. 121 illustrations. The Williams and Wilkins Company. Price $10.00.

Twenty-five authors, each a distinguished scientist in his field have contributed to this book which deals with the problem of aging in plants and animals and is of great importance because of its sociological and medical implications in a human society in which the proportion of older individuals is on the increase. The book deals with the problems of senescence in plants, the protozoa, invertebrates, insects, vertebrates and man. In man the problems are discussed as they affect tissues, organs and systems and man as a whole—not only in their morphological aspects but in their chemical and psychological aspects. The final chapter deals with the problems of aging from the viewpoint of the clinician. A book of exceptional value to the student of the physiological, pharmacological and medical sciences.

THE INDIAN JOURNAL OF PHARMACY,—Chief Editor M. L. Schroff, Benares Hindu University. Volume 1, number 1. January-March-1939. Price Rs. 3/-in India. Rs.4/-abroad.

This journal just established is the first pharmaceutical journal published in India. It appears quarterly and is the official organ of the United Provinces Pharmaceutical Association. Its pages will be devoted to the science and practice of pharmacy in all its branches. The first number is replete with information about pharmacy in India and in other countries including an analysis of our new Food and Drug Act. A number of scientific articles, notes and news from all parts of the world, book reviews covering British and United States

publications and an excellent series of abstracts entitled Keeping Up With Pharmacy, Pharmaceutical Chemistry, and Pharmacognosy. Note in the Editor's Mail, Editor Schroff has invited American contributions to the columns of the Journal. India is to be congratulated on this accomplishment which means so much to the advancement of pharmacy not only in India but throughout the world. The reading of this journal and the Editor's letters have already created a comraderie that makes the writer feel at home in India and a longing to breathe the friendly air in the halls and classrooms of Benares University. The Indian Journal of Pharmacy should be added to your library.

RUFUS A. LYMAN.

PHARMACEUTICAL LATIN AND PRESCRIPTION READING,—by M. L. Schroff, A. B., M. A., Raja Motichand and Professor of Pharmaceutical Chemistry and Head of the Department of Pharmaceutics, Benares Hindu University and G. P. Srivastava, B. Sc., Lecturer in Pharmaceutical Chemistry, Benares. 1938. 155 pages. Benares Hindu University Press. Price Rc. 3/2.

A short, clear, but sufficiently comprehensive text covering the fundamentals of Latin for the reading and writing of prescriptions. 71 prescriptions are given for the purpose of illustrating and interpreting the text. Four appendices are included consisting of abbreviations used in prescriptions, a Latin vocabulary and typical examination questions given at Benares University.

PHARMACEUTICAL ARITHMETIC,—A Companion Book to Pharmaceutical Latin and Prescription Reading by the same authors—1938. 111 pages. Benares Hindu University Press. Price 2/4.

An excellent book on the subject of pharmaceutical arithmetic. However, it is only applicable to such countries as use the British Imperial system of weights and measures. The following subjects are discussed; common weights and measures, calculation of dosage, density and specific gravity, percentage solution, thermometric scales, alligation, proof spirit, isotonic solutions and logarithms. The answers are given for all problems.

TEXTBOOK OF ZOOLOGY,—by George Edwin Potter, Ph.D., Professor of Zoology, Baylor University. 1938. 915 pages. 440 text illustrations. 15 color plates. The C. V. Mosby Company. Price $5.00.

One of the most comprehensive texts published. The author has selected a capable group of collaborators who have written chapters in their respective fields. It is refreshing to find a book written in a language as easy and interesting as fiction and yet with no loss of scientific accuracy or confusion of animal relationships. Interest is increased and a broader vision of animal life given by the addition of chapters dealing with animal anomalies, animal regeneration, biological effects of radiation, marine zoology, wild life conservation, regulatory glands, animal distribution, the animal and his environment, animal parasitism, comparative physiology and paleontology. The illustrations are clear cut and particularly suited to exact teaching, most of them are original and drawn for this book. The colored plates are excellent. A bibliography used in the preparation of the book and an excellent

glossary is included. The mechanics of the book are very fine. It is printed on a paper with a soft green shade which is comforting to the eye especially for night reading. If it is not used as a text, no pharmacy library should be without this book.

RUFUS A. LYMAN.

MEDICAL MUSSOLINI,—by Morris A. Bealle, Editor of Plain Talk Magazine. 1938. 255 pages. Columbia Publishing Company. Price $3.00.

To one who is scientifically trained books of this general type are inclined to be thought of as misguided efforts. It seems almost trite to say that in scientific experimentation there are many unknown factors that may influence an experiment and produce opposite results in the hands of equally competent experimenters and in fact in the hands of the same experimenter at different times. But when one finds a statement in a book that two experts rendered an opinion that the opinion of two other experts was "that much buncombe" when their published statements in the original article shows they did not, one is inclined to question the understanding of the writer. Of course, if one wants to go back into the history of any phase of human endeavor and muckrake, whether in history, politics, medicine, business, religion, or journalism, one can find plenty of errors and things in the upward struggle of man for better things of which we are not particularly proud. But why not let the dead bury the dead and write books that will lift us toward the fulfillment of the promise that the Easter morning brings. There are plenty of possibilities, even in medicine to write something constructive.

RUFUS A. LYMAN.

FUNDAMENTALS OF EXPERIMENTAL PHARMACOLOGY,—by Torald H. Sollman, M. D., Sc. D., Professor of Pharmacology and Materia Medica and Dean of the School of Medicine, Western Reserve, and Paul J. Hanzlik, A. M., Professor of Pharmacology, Stanford University, School of Medicine. 1939. 1939. 307 pages. Second edition. Illustrated. J. W. Stacey, Inc., San Francisco. Price $4.25.

The second edition of this well known laboratory guide brings up to date the developments in experimental pharmacology of the past ten years. Although it has been written mainly to acompany the medical courses in which many demonstrations are given in pharmacology at the Western Reserve and Stanford Universities, this book contains numerous experiments well suited to laboratory courses in pharmacology at the pharmacy colleges. The combined introductions to the experiments constitute a small text in pharmacological principles. The appendices contain valuable detailed information upon arrangement and general equipment of a department, operative anesthesia, methods of administering drugs to animals, physiological salt solutions for various purposes, isotonic solutions, uses of important synthetic dyes, a list of reference works and also an extensive dosage table. These appendices alone would seem to make the book indispensable to any pharmacology laboratory.

H. G. O. HOLCK.

SYSTEMATIC QUALITATIVE ORGANIC ANALYSIS,—by H. Middleton, M.Sc., A.I.C., Lecturer in Organic Chemistry, Bradford Technical College. 1939. 279 pages. Longmans, Green and Company. Price $2.50.

The author has prepared a laboratory guide for organic qualitative analysis in a simple and concise manner. The book is intended for students who have only an elementary knowledge of organic chemistry. No explanation is made of the reactions which are used in the preparation of derivatives for the identification of the compounds. A scheme of separation is given for the more common groups of organic compounds such as alcohol, aldehydes and phenols. Considerable use is made of reactions involving the formation of colored or odorous compounds in the identification of the unknown substances. However, in the majority of cases these are supplemented with derivatives having a definite melting point. Only estimated amounts of most ingredients used in making the tests are given in the directions. Considerable care has been given the choice of tests. The directions for conducting the experiments are clear. Only a few pages are devoted to the separation of mixtures. The book is particularly fitted to laboratory courses in organic pharmacy as practically all official organic compounds are mentioned in the various schemes of separation.

F. S. BUKEY.

A TREATISE ON PHARMACY,—by Charles Caspari, Jr., Late Dean and Professor of Pharmacy, School of Pharmacy, University of Maryland. Revised by E. F. Kelly, Secretary of the American Pharmaceutical Association. 1939. Eighth edition. 553 pages. 226 engravings. Lea and Febiger. Price $6.50.

This book by the illustrious Caspari is so well known it needs no extensive commentary here. It has been a standard text through seven editions. The eighth edition has been revised in keeping with the changes in the eleventh revision of the United States Pharmacopoeia and the sixth edition of the National Formulary. It is refreshing to see the body of the United States Pharmacopoeia dropped out of a text book of pharmacy and some attempt made to give the student the reasons for some of the pharmaceutical processes. One might question whether some sections of the book such as that which deals with enteric coatings, has been thoroughly modernized and it seems that many of the illustrations in the text have become museum specimens. Perhaps it was intended to retain them as a matter of historical interest. The publishers have done a fine piece of mechanical work and they deserve the latest in the pages.

RUFUS A. LYMAN.

Mr. W. H. Parker of the Arkansas Board of Pharmacy is carrying on an educational campaign in that state by the use of Pharmacy Guidance Leaflet No. 14. If a sufficient demand is created the State University will introduce pharmaceutical instruction into the curriculum. This will mean an increased pharmaceutical consciousness among the citizens of the state which will result in the improvement of public health because of a finer type of pharmaceutical practice. Thus again there appears above the horizon another cloud with a silver lining.

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(Continued from Inside Front Cover)

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